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BRIEF COURSE SERIES IN EDUCATION

THE PSYCHOLOGY OF CHILDHOOD

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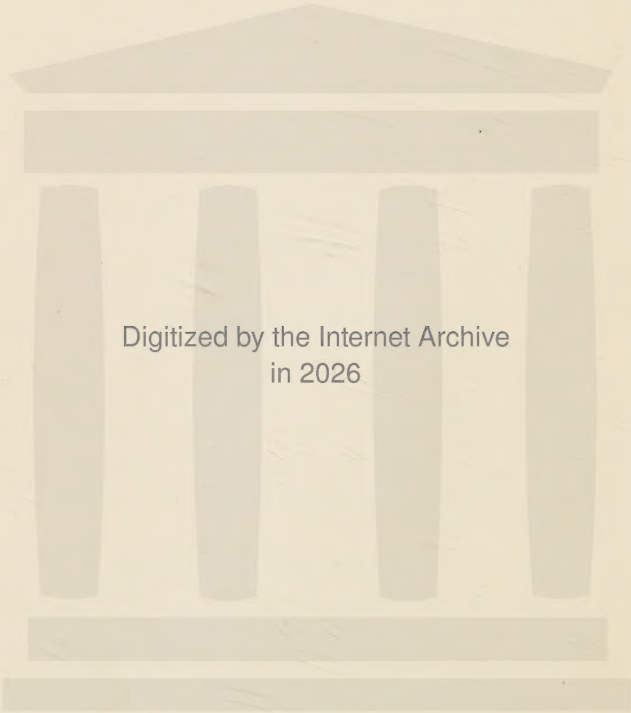
PREFATORY NOTE

THE first rough draft of part of this book was prepared by Professor Norsworthy in 1913, when it was suddenly put aside on account of illness and never thereafter touched. Some of it was later incorporated into the text "How to Teach," by Strayer and Norsworthy. When in 1916 it was urged that the preparation be resumed, since there seemed to be a felt need for a book of this type for use in normal schools, Miss Norsworthy's own physical condition precluded the attempt. Less than a fortnight before her death, when she was unable to talk over any details, she requested me to complete the work as arranged for in the plan of chapter titles. The task has involved a revision, partial rewriting, and the addition of several chapters. This may explain discrepancies in point of view and in style for which I can but apologize. Miss Norsworthy's many friends, to whom this book is affectionately dedicated, will, I am sure, understand that any adverse criticisms should be directed towards the reviser.

I am indebted for valuable help to Professor E. L. Thorndike, not only in retaining the many quotations from his works, and in the organization of the early part of the book, but also for much friendly criticism. My thanks are due also to Professors Strayer and Monroe, to Dr. Hollingworth for suggestions in chapter XVI, and to my cousin for assistance in proof reading.

MARY THEODORA WHITLEY.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INTRODUCTION

This book is written with a view to its use in normal schools. A course in general psychology is presupposed, since no space is devoted to the explanation of common psychological terms, though a glossary is added for easy reference. The authors are of opinion that the study of a special branch, such as child psychology, should follow rather than precede, or even accompany, a study of the more general science.

It is intended for a textbook, not for reference reading. To this end special features have been employed, *e.g.* marginal questions as well as topical headings, only limited references, sets of questions with each chapter. These last are of two distinct kinds, "exercises" and "questions for discussion." The former consist of problems, queries to be answered in writing, directions for observations, field-work; the latter are suggested for oral use in the classroom. Either or both kinds are given for each chapter. They have been tested by use, and it is believed that greater value will be secured if they are utilized in the manner indicated. The references following each chapter are in no way supposed to be adequate indexes of source material; but they suggest what may reasonably be required of a group of students working with a good-sized library at command.

Constant emphasis has been thrown on the physiological basis of the tendencies discussed, and Thorndike's classification of instincts, on the basis of the responses made, is adhered to throughout. Though in some instances suggestions for teaching are made, yet the greatest space is devoted to a descriptive study of children as differentiated from adults.

For immature students it may be found easier to begin with chapter II, postponing or omitting chapter I, also the last part of chapter XVII which deals wholly with statistics.

Naomi Norsworthy,
Mary Theodora Whitley.

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PSYCHOLOGY OF CHILDHOOD

CHAPTER I

SOURCE OF ORIGINAL NATURE

THE CONTRIBUTION OF NEAR ANCESTRY. — It is a fact so generally accepted that children resemble their parents that to utter it, much less dwell upon it, seems at first hardly necessary. "A chip of the old block," "his father's own child" are maxims of the race. Accepted though this fact is in theory, however, much of our treatment of children ignores it, and some of the commonly accepted aims of education are a distinct repudiation of it. Yet the **resemblances in families** are among some of the most striking facts of common observation. In the realm of the physical we find resemblance in all of the features, eye and hair color, stature, cephalic index, shape of hands or face, so much so that a child is often said to be the "exact image" of father or grandmother because of this closeness of likeness. Just as good eyesight and longevity are family characteristics, so also color blindness, left-handedness, some slight peculiarity of structure such as an extra finger or toe, or the Hapsburg lip, sense defects such as deafness or blindness, tendencies to certain diseases, especially those of the nervous system, — all these run in families. Certain mental traits likewise are obviously handed down from parents to child, such as strong will, memory for faces, musical imagination, abilities in mathematics or the languages, artistic talent. In these ways and many others children resemble their parents. The same general law holds of likes and dislikes,

What may a child inherit from his parents?

of temperamental qualities such as quick temper, vivacity, lovableness, moodiness. In all traits, characteristics, features, powers both physical and mental, and to some extent moral also, children's original nature, their stock in trade, is determined by their immediate ancestry. " We inherit our parents' tempers, our parents' conscientiousness, shyness and ability as we inherit their stature, forearm and span," says Pearson.[1]

What may each parent contribute to the make-up of a child?

But the original nature in terms of family inheritance is not determined merely by the natures of the parents: there are two *lines* of ancestors concerned in the production of every child. Sir Francis Galton, in his researches on heredity, reached the conclusion that one half of a child's original equipment was due to the influence of his parents, one fourth to his grandparents, one eighth to his great-grandparents and so on back in geometric ratio. Thus it sometimes happens that though a child appears to be a changeling, like no near relative, yet an investigation into the ancestral lines will usually explain the nature that seems a riddle when considering only the parent. The question as to whether inheritance is " blended " or " alternate " has as yet received no definite answer. Suppose one parent to have a given amount of a certain trait, and the other parent to have a given amount of an opposite one, the question is, will the child inherit one or the other trait, or will he inherit a compound of the two? In some cases a child " takes after " his mother, in others his father, and sometimes it seems that he is a combination of mother and father. It may be true that certain traits follow the first method, and others the second. The pigmentation of eyes and hair seems to follow the first, and stature seems to follow either of the laws. Then again, since a given trait in the offspring may be an inheritance from grand- or great-grandparent, it might appear neither as blend nor as alternate but some other thing.

[1] Pearson, Huxley Lecture, '03. Journal Anth. Inst. 32.

Mendel's law [1] explains very clearly how these traits may occur in children, making them surprisingly unlike either parent in this one particular trait, but entirely like some ancestor of three or four generations ago. It is very difficult to discern which method is followed by mental and temperamental traits, and at present nothing definite is known, because of the complexity of the thing called a trait or a characteristic. Each amount of every trait has, in Mendelian terms, a certain determiner in the germs which go to make the individual; each determiner may be either a unit or multiple, and again it may be either variable or invariable. Just what is the determiner that is effective in producing leadership, or gentleness, or quick temper, or energy, is not known; and therefore its nature, as to whether unitary or multiple, and the laws governing its transmission, are equally unknown. Certain features and traits of plants and animals have been analyzed into their unit characters, and the determiners of these have been controlled by those interested in the breeding of a certain stock, but with the human animal and with the more complex traits of the lower animals, hardly more than a beginning has been made.

Specialized inheritance. — Granted that near ancestry has much to do with the make-up of the original nature of a child, the question naturally follows as to whether specific traits, the specialization of ability, is also the result of family

[1] When two varieties of a species, having different characteristics, are crossed in breeding, the resulting hybrid generation resembles one parent, the "dominant"; the "recessive" characteristic of the other is apparently suppressed, but is really latent, for it will appear in later generations. When the hybrids are inbred, 25 per cent of their offspring have the "recessive" characteristic of one grandparent, 25 per cent have the "dominant" characteristic of the other. The other 50 per cent may either resemble the hybrid parents, or be indistinguishable from the 25 per cent "dominants" till they in turn produce another generation. Thus, black (dominant) Andalusian fowls mated with white (recessive) produce nothing but slaty blue. The blue hybrids, if mated, produce in a brood of twelve, three white, three black, and six blue.

See Punnet, Mendelism, pp. 17–78 for a full account.

inheritance. Does the inheritance from near ancestry simply lay down the general lines of development, give the direction or the tempo of attainment, provide the total amount of energy, make one a genius, without determining in what special field the gift is to be manifested? In other words, is inheritance merely in terms of the general or is it highly specialized?

Is inheritance special or general?

All the investigations made up to the present show decisively that the inheritance is very highly specialized. Galton in his "Hereditary Genius"[1] shows that "out of 286 judges, more than one in every nine of them have been either father, son or brother to another judge." Concerning the relatives of eminent statesmen, he says: "The combination of high intellectual gifts, tact in dealing with men, power of expression in debate, and ability to endure exceedingly hard work, is hereditary." He finds similar specialization of ability in the careers of the relatives of great commanders and literary men. Galton and Ellis emphasize the fact that painters form a group in which the specialization of abilities in families is most striking. Nine painters of great merit are found in the family of Titian; and Raphael, Van Dyck, Murillo likewise belonged to families celebrated for their artistic genius. In a list of forty-two families Galton found twenty-one who had illustrious relatives. In musical genius the same specialization in inheritance is found. "Beginning with Weit Bach the Prisburg baker, we have a record of an unbroken line of musicians of the same name that for nearly two centuries overran Thuringia, Saxony and Franconia. In the family there were twenty-nine eminent musicians. The names of Beethoven, Mendelssohn, Mozart and Haydn represent families famed for their musical abilities."[2]

The investigations of the special abilities of school children of the same family point to the same general truth. Pearson found that inheritance in such traits as popularity, temper,

[1] Pages 62 and 104.

[2] Bolton, Principles of Education, p. 190.

handwriting was to almost the same degree as in stature and eye color. Burris found that superiority in one single high-school study is nearly or quite as much a matter of heredity as is general ability to do well in school work. This specialization in inheritance obviously explains the fact that two children of one family alike in one trait as a result of heredity may be quite unlike in other traits. Even twins who may be similar in physical traits may be dissimilar in mental. Two children may both be good spellers, yet one quick and the other slow in reaction time: both may have quick tempers and one possess the power to control it which the other lacks. Thus, upon analysis, the fact of a child's resemblance to his parents is seen to be in reality the sum total of his physical and mental traits, each resembling, more or less in independence of other traits, the corresponding trait in either parent, or some more remote ancestor.

Variation. — The working of the law of resemblance in families is sometimes obscured by two other principles — namely, the principle of variation and the principle of return towards the average. The first of these principles involves the fact that a parent will produce offspring in whom his own traits will be approximated rather than duplicated. If it were possible to grade these traits on a very fine scale, we should find the ratings of the children's traits *varying* about the point near which the parent's rating occurred, that is to say, not just exactly at the same point. Thus it comes that no two natures are identical. Even in the case of " identical twins " where the antenatal influences are so nearly the same, the natures may vary widely. And this must be so long as the germs producing the individual vary. Two children of very different, almost opposing natures, may be found in the same family, and this fact instead of a contradiction is really a proof of the closeness of family inheritance, as it is also a proof of the complexity and variability of the germs which produce human nature. Because of this vari-

ability, stupid parents may have gifted sons, quick-tempered parents stolid sons, short parents tall sons, inartistic parents artistic sons.

Regression. — The other principle of return towards the average is one that arouses the comment of even the unobserving. It is the exception to find the child of a great genius possessing ability equal to his father's, no matter in what the genius may be displayed. Abilities die out, even in thoroughbreds of racing stock when all precautions are taken with respect to breeding and training. That is, the ratings of children do not cluster immediately about the station occupied by their exceptional parents, but about a point somewhere between the extreme position occupied by their parents and the average. For example, the records of height of the children of a man three inches taller than the average will not cluster about that point, but about a point one or two inches above the average. This principle, other things being equal, is effective whether the rating be above or below the average, but other things are not always equal at the lower end of the scale. Thus nature in the working of the laws of heredity is always pulling towards the average and so providing for solidarity and balance; at the same time, because of the principle of variation, new possibilities, genius, and talent are continually being produced.

Non-transmission of acquired traits. — The question as to whether the original nature of a child is directly influenced by the acquisition of the parents has been hotly discussed. Practically stated, the question is, can a man pass on to his offspring only the nature that he inherits, or also any acquisition or skill that has come as a result of education or training? For example, would the son of a man born at the height of his father's success as a writer be more likely to inherit literary ability than one born at the beginning of his career? Of course the obvious way to solve this question is by experi-

Does a parent transmit traits he acquires?

ment, by allowing generation after generation — all the members of each — to acquire a certain habit, and then testing to see whether the acquisitions come more rapidly as generation succeeds generation. No decisive experiments have been carried out, although attempts along this line have been made.[1] The conclusion must therefore rest at present on merely theoretic grounds, and in consequence be but tentative. Following Lamarck, a school of psychologists and biologists declare their belief in the possibility and the fact of the transmission of acquired traits. Weismann and those who follow him take the opposite side of the question and declare that such transmission is impossible. Such facts as these: a parent is an expert baseball pitcher, and his son excels in the same line also; a parent is expert in the use of her needle, and her daughter shows the same trait; a parent is an expert linguist, and the children have the same talent, — all, according to Weismann, would be explained by the same reason, namely: because the characteristic was a part of the original equipment of each generation, a result, in other words, of heredity. The human race has changed from primitive times, language and culture have grown up, such facts as walking in an upright position and using the hands dexterously have attained their perfection, the traits of intellect and character have outgrown those of brute strength and sagacity, not as a matter of transmission directly from generation to generation, but as a result of gradually changing social conditions, and the working of the law of selection. "Not the inheritance of acquisitions, but the selection of those who could acquire." [2]

Nature versus nurture. — The discussion so far has been emphasizing the importance and the strength of family in determining the original nature of the individual. As an outcome of such discussion the questions naturally arise, —

[1] For a full account, see J. A. Thomson, Heredity, ch. VII.

[2] Thorndike, Original Nature of Man, p. 233.

Is a man then what he is because of his family? or Does his training or his environment influence his attainment, and if so, to what extent? In other words, the question raised is as to the relative importance of nature and nurture. The first and even now the most comprehensive study of this question is the work done by *Sir Francis Galton* in his book entitled "Hereditary Genius." He examined the careers of the relatives of 977 men of genius, each of whom would be ranked as one in four thousand for intellectual attainment, and then compared with these the careers of the relatives of 977 men of average ability of the same social rank. If nurture is the stronger factor, the proportion of eminent men in the two groups should be approximately the same, for the nurture was that of families of the same social standing in England. His results were as follows: In the first group he found 89 fathers, 114 brothers, 129 sons, — a total of 332 men of eminence; 52 grandfathers, 37 grandsons, 53 uncles, 61 nephews, — a total of 203 men of eminence. The 977 eminent men had 535 eminent relatives. In the second group he found one father, brother, or son; three grandfathers, grandsons, uncles, and nephews together. The 977 average men of the same social standing had but four eminent relatives. To some people this may not be convincing, for the plea is made that the surroundings of a child in the family of an eminent man cannot be the same as those in the family when the ability of parents is only average, despite a similarity in social rank. This objection may be answered by Galton's study of the adopted sons of popes. In different centuries boys were adopted by men of undoubted ability, brought up in the atmosphere of the highest culture, intellectual and executive attainment of their times; yet history does not record that any achieved the degree of eminence reached by the real sons of gifted men. Nature, not nurture, seems to be the determining factor.

Is nature or nurture the stronger determinant?

Studies of twins. — Thorndike studied fifty pairs of twins taken from the New York public schools to see whether there was a greater degree of resemblance between them than between other brothers and sisters. A greater similarity between them would mean that nature was stronger than nurture, for it is in a greater identity of nature that twins differ from ordinary siblings. The results obtained are shown in the following table.[1] R means the resemblance found between the twins.

In the A test	R = .69
In the a-t and r-e tests	R = .71
In the misspelled word test	R = .80 plus
In addition	R = .75
In multiplication	R = .84
In the opposite test	R = .90

For the ordinary siblings but a few years apart in age in the tests that have been made the resemblance is less than half as great. Thorndike gives two additional reasons for believing that this close similarity could not have been caused by environmental conditions. In the first place, were environment the cause, the longer it had to act the greater should grow the resemblance, and twins of 13 and 14 years old should be more alike than those of 9 and 10. This is not found to be the case. In the second place, if training is the cause the traits that are much open to the influences of training should show a greater similarity than those little subject to training; they do not show any greater similarity, however. Thorndike's evidence is then in accord with Galton's conclusion: namely, that nature is the prepotent influence in determining intellectual ability. Pearson and Heymans and Wiersma studied the same question by having teachers, physicians, or members of the family rate the children in the family, or the parents and children, on certain

[1] Thorndike, A Study of Twins.

qualities and traits; the degree of likeness being considered a measure of the effect of heredity. Both these studies are open to criticism, but it is believed their results show that heredity far outweighs the influence of home training.

Studies in royalty. — Dr. Frederick Adams Woods in his study of "Mental and Moral Heredity in Royalty" reaches the same conclusion. He chose 671 persons in the royal families of Europe in general from as far back as the sixteenth, in some cases from the eleventh, century. He gave each a rating determined as objectively as possible on the scale of from 1 to 10 in intellect, also another rating in morality; then he studied the distribution of the ratings. The degree to which certain ratings cluster in families shows the influence of heredity, for were that not the influential factor, the various grades would be scattered at random. Imagining a complete chart to be constructed, large enough to contain all these 671 people arranged as in the familiar genealogical "tree," he says, "if such a great chart were constructed, we should see the geniuses, or (9) and (10) grades, not scattered at random over its entire surface, but isolated little groups of (9) and (10) characters (the individuals within each group contiguous to each other) would be found here and there. One such group would be seen centering around Frederick the Great, another around Queen Isabella of Spain, another in the neighborhood of William the Silent, and still a fourth with Gustavus Adolphus as a center. . . . Those in the lowest grades for intellect would also be found close to others of the lowest type, and would fall specifically in Spain and Russia. . . . There would be certain regions composed almost entirely of grades from (4) to (7). . . . The upshot of it all is that as regards intellectual life, environment is a totally inadequate explanation. . . . Therefore it would seem that we are forced to the conclusion that all these rough differences in intellectual activity which are susceptible of grading on a scale of ten are due to predetermined differences

in the primary germ cells." [1] In his conclusion with respect to the effect of environment on morality Dr. Woods is less emphatic, although he still believes that of the two factors "inheritance plays, in the formation of morality, a force greater than fifty per cent." However, the fact that he finds most of the moral degenerates in families where also insanity, epilepsy, or other psychoses are closely associated suggests that though in the lower extreme of morals, especially when there is hereditary intellectual taint, the conclusion may be in favor of heredity, still in the average person with a sound body the effect of environment in determining his morality may be greater than 50 per cent.

THE CONTRIBUTIONS OF SEX. — Another factor operative in producing the original nature of an individual is the fact of sex. That men and women are different, that their natures are not the same, has long been an accepted fact. Out of this fact of difference have grown many hot discussions as to the superiority of one or the other nature as a whole. The present point of view of scientists seems well expressed by Ellis when he says, "We may regard all such discussions as absolutely futile and foolish. If it is a question of determining the existence and significance of some particular physical or psychic sexual difference, a conclusion may not be impossible. To make any broad statement of the phenomena is to recognize that no general conclusion is possible. Now and again we come across facts which group themselves with a certain degree of uniformity, but as we continue, we find other equally important facts which group themselves with equal uniformity in another sense. The result produces compensation." [2]

In what ways may boys' original nature differ from girls'?

The question of interest then is, what in nature is peculiar to the male sex and what to the female? What traits will be

[1] Woods, Mental and Moral Heredity in Royalty, pp. 265 and 266, and p. 286.
[2] H. Ellis, Man and Woman, p. 449.

true of a boy, merely because he is a boy, and vice versa? This has been an extremely difficult question to answer, because of the difficulty encountered in trying to eliminate the influence of environment and training. Boys are what they are because of their original nature plus their surroundings. Some would claim that could we give boys and girls the same surroundings, the same social requirements, the same treatment from babyhood, there would be no difference in the resulting natures. Training undoubtedly accentuates inborn sex differences and it is true that a reversal of training does lessen this difference; however, the weight of opinion at present is that differences in intellect and character do exist because of differences of sex, but that these have been unduly magnified. H. B. Thompson, in her investigation entitled "The Mental Traits of Sex," finds that "Motor ability in most of its forms is better developed in men than in women. In strength, rapidity of movement, and rate of fatigue, they have a very decided advantage, and in precision of movement a slight advantage. . . . The thresholds are on the whole lower in women, discriminative sensibility is on the whole better in men. . . . All these differences, however, are slight. As for the intellectual faculties, women are decidedly superior to men in memory, and possibly more rapid in associative thinking. Men are probably superior in ingenuity. . . . The data on the life of feeling indicate that there is little, if any, sexual difference in the degree of domination by emotion, and that social consciousness is more prominent in men and religious consciousness in women." [1]

Pearson in his measurement of traits, not by objective tests but by opinions of people who know the individual, finds that boys are more athletic, noisy, self-assertive, self-conscious; less popular, duller in conscience, quicker-tempered, less sullen, a little duller intellectually and less efficient in penmanship. Heymans and Wiersma, following the same general method as

[1] Thompson, Mental Traits of Sex, pp. 169, 170, 171.

Pearson, state as their general conclusions that the female is more active, more emotional, and more unselfish than the male. "They consider women to be more impulsive, less efficient intellectually, and more fickle than men as a result of the first two differences mentioned above: to be gifted in music, acting, conversation and the invention of stories as a result in part of the second difference; and to think well of people and to be easily reconciled to them as a result of the third." [1] Thorndike finds the chief differences to be that the female varies less from the average standard, is more observant of small visual details, less often color-blind, less interested in things and their mechanisms, more interested in people and their feelings, less given to pursuing, capturing, and maltreating living things, and more given to nursing, comforting, and relieving them than is the male. H. Ellis considers the chief differences to be the less tendency to variability, the greater affectability, and the greater primitiveness of the female mind, and the less ability shown by women in dealing with the more remote and abstract interests in life. All the authors emphasize the smallness of the differences; and after all the striking thing is not the differences between the sexes but the great difference within the same sex in respect to every mental trait tested. The difference of man from man, and woman from woman, in any trait is almost as great as the differences between the sexes in that trait. Sex can be the cause then of only a fraction of the differences between the original nature of individuals.

Are there racial differences in original nature?

THE CONTRIBUTION OF RACE. — A third source of original nature is race. It has been customary to laud the white, and in particular the Anglo-Saxon race as that in which the intellect has most developed, the race that excels all others in its genius, its power to invent and to reason. In contrast to it

[1] Thorndike, Educational Psychology, Vol. 3, p. 200. Heymans and Wiersma, Zeitschrift für Psychologie, Vol. 45.

the darker races have been held up to scorn. The keen sense power of the American Indian and the African Kaffir has been commented upon and the law of compensation has been called upon to explain why they have not progressed further. A critical reader will at once note that the evidence upon which these deductions are based is almost entirely anecdotal rather than scientific, depending upon untrained travelers' tales instead of upon objective tests. Hence no allowance has been made for training, for customs, or for surroundings.

Woodworth's tests. — One of the first serious investigations into race differences was made by R. S. Woodworth at the St. Louis Exposition in 1904. Summarizing his results and those of other investigators as to keenness of senses he says: "On the whole, the keenness of the senses seems to be about on a par in the various races of mankind." In tests of reaction time and power and of making simple judgments he found that the "results tend to show that simple sorts of judgments, being subject to the same disturbances, proceed in the same manner among various peoples: so that the similarity of the races in mental processes extends at least a step beyond sensation." When it comes to testing general intelligence, however, the matter becomes much more complicated. In reporting on a very simple test of intelligence he says: "If their results could be taken at their face value, they would indicate differences in intelligence between races, giving such groups as the Pygmy and Negrito a low station compared with most of mankind."[1] The doubt as to whether they can be taken at face value arises from the fact that the tests administered may not have been equally fair, equally novel to all the races. However, Woodworth's conclusion as to the low rank of the negroid races is borne out by such investigations as have been made into the relative standings of the white and negro children in the public schools even though these may be subjected to the same criticism noted,

[1] R. S. Woodworth, Racial Differences in Mental Traits, pp. 176, 181.

namely, the conditions may not have been identical. In opposition to this H. Ellis says, "The child of many African races is scarcely if at all less intelligent than the European child, but while the African as he grows up becomes stupid and obtuse, and his whole social life falls into a state of hide-bound routine, the European retains much of his child-like vivacity," [1] a difference then either of nurture and not of original nature, or of some hereditary factor curtailing progress after puberty in the one case but not in the other. Something has been done along the line of comparing the different nations, but no definite conclusions have been reached.

Recent investigations. — More recently there have appeared a number of studies by Mayo, Pyle, Rowe, Perring, and others dealing with differences between negro and white, or Indian and white children in the schools of this country. Whether the Binet-Simon tests or the ordinary school grades were used as a measure the results appear in favor of the whites. Perring,[2] in the schools of Philadelphia, found twice as much retardation among negro as among white children, also that the amount of retardation was greater, being two years on the average for the negro, one and a half for the white. Pyle,[3] as a result of psychological tests given to over four hundred children of each race in various towns in Missouri, shows that the girls in both races were better than the boys, that there was less difference between negro and white girls than there was between negro and white boys; that the racial difference was greater in the more difficult tests than in the easier ones. Taking all tests together, only one fifth of the negro children did as well or better than the average of the white children. In a later series of tests where there was a more direct measurement of learning capacity as the effects of environment were better eliminated, Pyle says that the negro children showed

[1] Ellis, Man and Woman, p. 446.
[2] Perring, in the Psychological Clinic, 1915, 9.
[3] Pyle, in the Psychological Bulletin, 1915, 1916.

from three quarters to four fifths the ability of the white children. He notes also that the success of the negro increases with a greater proportion of white ancestry.

Another finding, that the racial difference was less with older children than with younger, does not bear out the conclusion reached by Odum,[1] who states that the young negro child compares favorably with the white in school attainment, yet that with the approach of puberty the mental growth of the negro suffers arrest — he appears dull and stupid. On this point it is interesting to compare these facts: (1) Among adolescent girls tested by Baldwin [2] the negroes did only 62.4 per cent as much learning work in a given time as did the whites, and made 245.3 per cent more errors. (2) In the high schools of New York City, Mayo [3] found that the median mark attained by the whites was 66, by 150 negroes was 62, with less variation. Twenty-nine per cent of the colored children reached the median mark of the whites. Although this is better than Pyle's one fifth, and agrees as to the lessened difference among the older children, it should be remembered that the negroes in the high school probably represent a very much higher sampling of their race than do the whites. (3) Apparently the rate of maturing is more rapid with colored children than with white, a condition which does not correlate with the highest mental development. (4) Da Rocha says that though less subject to epilepsy, the colored children are more subject to periodic insanity than are whites.

Rowe,[4] from using the Binet-Simon tests with 268 Indian children, declares that they are both slower, and everywhere inferior to the whites; also that they are weaker in the kind of test involving higher mental processes than in those of a more purely mechanical nature. He adds that there is more

[1] Odum, Mental and Social Traits of the Negro.
[2] Baldwin, Journal of Educational Psychology, 1913, 4.
[3] Mayo, The Mental Capacity of the American Negro.
[4] Rowe, Pedagogical Seminary, 1914, 21.

difference between the Indian and the white child than there is between the negro and the white child.

These are interesting pieces of work; at present we need repeated, extensive studies of a similar character before we can consider all the facts as established.

Improvement of the race as a whole. — Granted that human races are much more alike than different, that "there is much overlapping and the differences in original nature within the same race are, except in extreme cases, many times as great as the differences between races as a whole," the further question arises as to whether the human race as such has a nature which differentiates it from other animals. Has man from earliest times had a nature that is approximately the same? The differences between animals and man may be slight; it may be true, as Thorndike says, that the chief difference between animal brain and human brain is "an increase in the number, delicacy, complexity, permanence and speed of formation of associations." Again, "Amongst the minds of animals that of man leads, not as a demi-god from another planet, but as a king from the same race." But is there an average or norm for human traits and powers which has been more or less constant since primitive man appeared, and is it different from that of the animals? To this question, too, no absolute answer can be given. Up to within a few years it was current opinion that primitive man was much closer akin to the animals than to man of to-day, — that the changes in ideals, in customs, in social standards and in industries are due to physiological differences in the brain of mankind which have gradually been evolved. But to-day, in several quarters, especially among anthropologists, doubt is being expressed as to whether any fundamental differences exist between the original nature of primitive man and that of the man of the twentieth century. The fact of the marked similarity of the races suggests this conclusion, and further, Boas says, expressing doubt as to the gain of modern man in

intellect and morality over primitive man, — " Before we entered into the comparison of the mental life of primitive man and of civilized man, we had to clear away a number of misconceptions caused by the descriptions of the life of primitive man. We saw that the oft-repeated claim that he has no power to inhibit impulses, no power of attention, no originality of thought, no power of clear reasoning, could not be maintained; and that all these faculties are common to primitive and to civilized man. . . . This led us to a brief consideration of the question whether the hereditary mental faculty was improved by civilization, an opinion that did not seem plausible to us." [1]

Race, then, the fact of being a member of the human race, bears with it certain capital in terms of original nature. Because we are men and women instead of squirrels or elephants, we have certain traits, powers, and possibilities; and the whole human race is probably far more on a level so far as this inheritable fund of capacity is concerned than has been commonly supposed.

CONCLUSIONS. — The whole point of view of this chapter is to emphasize the facts of original nature and equipment. A man is what he is primarily because he is a member of a certain family, sex, and race. Those three factors give him his inheritance, his capital, his stock in trade, and these birthday gifts bound his ultimate achievement. True, environment, training, education, play their part in the production of man as we idealize him, but that part is conditioned and limited by the nature which is being influenced. In other words, though Burbank may produce a prickless thistle by careful selection, and though we may improve a variety of figs immensely by careful regulation of the environment, yet we need never expect to gather figs from thistles, their natures being originally so differently determined.

Thorndike writes: " The importance to educational theory

[1] F. Boas, The Mind of Primitive Man, p. 247.

of a recognition of the fact of original nature and of exact knowledge of its relation, shown in determining life's progress, is obvious. It is wasteful to attempt to create and folly to pretend to create capacities and interests which are assured or denied to an individual before he is born. The environment acts for the most part not as a creative force but as a stimulating and selective force. We can so arrange the circumstances of nurture as to reduce many undesirable activities by giving them little occasion for appearance, and to increase the desirable ones by ensuring them an adequate stimulus. We can, by the results we artificially attach to wisdom, energy or sympathy, select them for continuance in individual lives. But the results of our endeavors will forever be limited as a whole by . . . inborn talents and defects." [1] Nor is this limitation of human possibilities of growth a pessimistic doctrine. The sure realization of what has always been true is not pessimism, nor is it itself any curtailment of actual attainment. When the differences between the actual life of a savage in Central Africa and that of a civilized man are considered, the tremendous effect of environment as a stimulating and selective force on races is overwhelming. And when, as James has so effectively pointed out, the differences between the ordinary, everyday life of an individual and that of the same individual in some great issue of life are considered, the probabilities of unknown and unused levels of energy and force in every human creature seem indisputable. The educator has still a task of infinite magnitude amid unknown potentialities, and to make due allowance for the sources and limitations of original nature will but make his work more effective and less wasteful. The recognition of the respective parts played by nature and nurture make it imperative for him to know the child mind in terms of its equipment, and to know the laws by means of which it may be changed.

[1] Thorndike, Educational Psychology, p. 44. 1903 edition.

Exercises

1. *a.* In studying heredity, one could easily breed twenty generations of mice or rabbits; twenty human generations would take over 600 years. This illustrates one difficulty in the way of accurate knowledge of human inheritance. What others occur to you?

b. To prove Mendelian inheritance in two simple, unvariable units, we need 16 offspring, for three units we should need 64; what further difficulty does that suggest?

c. In what way does Woods' study escape some of the difficulties you have mentioned?

2. *a.* What facts about immediate family inheritance would a teacher be wise to discover about the children in her charge?

b. What facts should any one offering vocational guidance find out about the heredity of the young people?

Questions for Discussion

1. Considering merely the facts of mental equipment, what is your attitude towards coeducation? Why?

2. Is there any reason for believing that women are more tactful than men? Explain.

3. In what school subjects would you expect girls and boys respectively to excel? Why?

References for Reading

E. L. Thorndike, *Educational Psychology*, chs. 3, 4, 5.
F. Galton, *Hereditary Genius*.
J. A. Thomson, *Heredity*, ch. 6.
H. B. Thompson, *Mental Traits of Sex*.
F. Boas, *The Mind of Primitive Man*.

CHAPTER II

THE CHARACTERISTICS OF ORIGINAL NATURE

DEPENDENCE ON PHYSIOLOGICAL STRUCTURE. — The inheritance of an individual, whether it be that of family, sex, or race, is in terms of physiological structure, not in terms of mental states. A baby is not heir to any ideas, his emotions or ideals are not ready-made, he does not inherit consciousness as such; he does inherit a complicated system of neurones acting and developing according to certain laws of growth. The various theories as to the interaction of brain and mind, happenings in the synapses and states of consciousness need not be entered upon here. For our purpose it is enough to state that any individual's original nature is related in some very close way to the action of his nervous system. A child acts as a human being rather than as an animal because he inherits a human nervous system; he is interested more in things than in people, is pugnacious and matter-of-fact because he inherits the nervous system of a male; he is a musician rather than a business man because he inherits the nervous system of a Bach. No matter how general the trait may be, no matter how minute and unimportant the characteristic, its presence is dependent on some connection of the neurones.

What is the physical basis of mental heredity?

It is not necessary here to go into a detailed description of the physiology of the brain and spinal cord. It is perhaps sufficient to recall a few important facts from general psychology. The nervous system is composed of neurones of three types: those that receive, the afferent; those that effect action, the efferent; and those that connect, the associative.

The meeting places of these neurones are the synapses. All neurones have the three characteristics of sensitivity, conductivity, and modifiability. In order for conduct or feeling or intellect to be present at least two neurones must be active, and in all but a few of the human activities many more are involved. The possibility of conduct or intelligence depends upon the connections at the synapses, — upon the possibility of the current affecting neurones in a certain definite way. The possession of an "original nature," then, means the possession, as a matter of inheritance, of certain connections between neurones, the possession of certain synapses which are in functional contact and across which a current may pass merely as a matter of structure. Just why certain synapses should be thus connected is the whole question of heredity. Two factors seem to affect the functional contact of a synapse, — first, proximity of the neurone ends, and second, some sort of permeability which makes a current travel on one rather than another of two neurones equally near together in space. This proximity and permeability are both provided for by the structure and constitution of the nervous system. It should be noted that the connection of neurones is not a one-to-one affair, but the multiplicity of fibrils provided by original nature makes it possible for one afferent neurone to discharge into many neurones, and for one efferent neurone to receive the current from many neurones. Thus the individual when born is equipped with potentialities of character, intellect, and conduct, because of the pre-formed connections or tendencies to connections present in his nervous system.

TYPES OF ORIGINAL RESPONSES. — These unlearned tendencies which make up the original nature of the human race are usually classified into automatic or physiological actions, reflexes, instincts, and capacities. Automatic actions are such as those controlling the heart-beats, digestive and intestinal movements; the contraction of the pupil of the eye from light, sneezing, swallowing, etc., are reflexes; imi-

tation, fighting, and fear are instincts, while capacities refer to those more subtle traits by means of which an individual becomes a good linguist, or is tactful, or gains skill in handling tools. However, there is no sharp line of division between these various unlearned tendencies; what one psychologist calls a reflex or a series of reflexes, another will call an instinct. It seems better to consider them as of the same general character but differing from each other in simplicity, definiteness, uniformity of response, variableness among individuals, and modifiability. They range from movements such as the action of the blood vessels to those concerned in hunting and collecting; from the simple, definite, uniform knee-jerk, which is very similar in all people and open to very little modification, to the capacity for scholarship, which is extremely complex, vague as to definition, variable both as to manifestation in one individual and amounts amongst people in general, and is open to almost endless modification. This fund of unlearned tendencies is the capital with which each child starts, the capital which makes education and progress possible, as well as the capital which limits the extent to which progress and development in any line may proceed.

What are the characteristics of original tendencies?

CHARACTERISTICS OF ORIGINAL RESPONSES. They are mechanical. — These unlearned tendencies which constitute the original nature of the child have certain characteristics in common; because they are a function of the nervous system they are mechanical and constant. They all exist because of connections in the nervous system, and therefore they are unconscious, and uncontrolled in their initiation. The nervous system acts like a machine, — indeed it *is* a machine, and in so far as it acts independent of training or experience, the result must be mechanical. A current is started in the retina of a nine-months-old baby by a glittering object held in front of him; compelled by the structure of his nervous system he must snatch at it, not because he wants it, not because

he wills to do so, but because he is thus made, he cannot help it. Not at all a matter of volition, or of conscious attention, the act is merely a matter of the connection of neurones. In so far as tendencies are unlearned, this must be true, whether the tendencies concerned are the simple definite reflexes, or whether they are the more complex and vague capacities. This is an important fact for the student of child psychology; for many of the mistakes in the training of children are due to a lack of comprehension of this principle. A child is not responsible for his conduct, thoughts, or feelings in so far as they are a manifestation of these unlearned tendencies; he acts merely as a machine, controlled absolutely by its mechanism until experience, learning in some form, affects him. Of course, in the human animal, experience plays a part very soon because of the plasticity of the organism; but, until it does, no responsibility can rest on the child, and experience can play no part until the tendency has at least shown itself as a result of the functioning of his nervous system.

They are constant. — These unlearned tendencies are constant in the sense that in the same organism, the same stimulus must induce the same response, the same neurone-action must produce the same result; and, conversely, an identical response is given only to one stimulus. This fact must necessarily be true because of the structure of the nervous system and the dependence of tendencies on the functional contact of the synapses. That this principle seems to be often contradicted is due to two facts. First: situations which on the surface seem the same are really different, and hence the difference in the response. To a boy looking on at a group of other boys stoning a cat, the stimulus is very different from what it would be were he a member of the group. A ball thrown to a baby by an adult offers a very different situation from the same ball thrown to the same baby by a child of his own size. A cat sniffing at a child seated alone on the floor may produce a very different response from what it would

were the child in its mother's lap. Situations the same so far as the rough, observed outlines are concerned may be very different when all the details are considered, and hence call out very different responses in the organism.

Second: the apparently same situation causes different responses because the organism is not the same but different. This difference in the organism may be due to a number of causes, — differences in nutrition, in fatigue, in mind's set, in the simultaneous activity of other instincts, in experience, — all these change an organism, and therefore must make the response to the same situation a different one. A child's response to a kind word may one day be a smile, and the next an impatient twitch of the shoulders and a scowl, the child being different on the two occasions. A boy in the primary grades responds to the commendation of the teacher by added efforts, though the same boy in the high school may respond by a sneer. This difference in response is not a mere matter of chance; original nature is not erratic and variable in the sense that it is not to be depended on. The same situation presented to the same organism must produce the same response; but situations are complex, and the organism is a changing thing. However, because of their dependence on structure, a careful analysis of the situation and a knowledge of the individual will make it possible to predict behavior with an ever increasing degree of accuracy. It is because of the likeness of human beings to each other due to their common racial inheritance, and to the fact that this original nature can be depended on to be constant in its manifestation, that group teaching is at all possible. In fact, were the responses due to original nature not predictable, education as we know it to-day could not exist. Added knowledge of the original equipment of children and of the effect of sleep, nutrition, age, and various kinds of experiences on the organism will increase the power of educators to foretell the response of any given individual or group to any given situation. At

present both teachers and parents are suffering from a lack of knowledge in all these lines.

They are delayed. — Another characteristic true of the majority of these original tendencies is that they are delayed, that is, they are not present at birth. Then, as Pillsbury says, " one may recognize the food-taking instincts, the vocal protests at discomfort, but relatively few others." Of course, the physiological operations necessary for the life of the infant are active, but practically all of the so-called instincts and capacities appear later. Their appearance is dependent on the growth and ripening of the connections between neurones. No tendency can appear until the synapses between the neurones which arouse it are in functional contact.

In discussing this point of the delay in the appearance of original tendencies, it has been customary to talk of them as if they appeared suddenly, certain ages being the time above all others for certain instincts and capacities to mature. Thus we hear of the " sensory " child of kindergarten age, her " motor " sister in the primary school, her " rote-memorizing " friends in the grammar grades, and her " reasoning " adolescent brothers and sisters. Similarly, at three or four we are told to expect fears to be dominant, doll play at eight, collecting at nine, the gang instinct at eleven, the sex instinct in the teens, and so on. That there is somewhat of truth in these statements there can be no doubt, but as they stand, they are often misleading. It seems very improbable that any instinct is absent this week — or year even — and present the next. From all the studies that have been made — whether of the simple and definite instincts, or the more complex and vague capacities — the law seems to be one of gradual rather than of sudden maturing. It is probably true, as Miss Burk says, that nine is the age when the greatest interest in collections is shown, but it should also be borne in mind that children begin making collections at five or six. We know now that the sex instinct is of long and slow development all through

childhood rather than bursting into being during adolescence. Even four-year-olds show the power of purposive thinking despite the fact that the high-school age is supposed to be the time for reasoning. Little six-year-old children who have to care for younger brothers and sisters do so with all the seriousness of the adult; and many refugee boys of nine and ten have had to assume much of the responsibility which is supposed to come with maturity. Children tested from year to year show no time at which there is so sudden an increase in power that any certain age could be chosen as the one at which the instinct "appears." Of course, the interference of training and environment as a factor is undeniable; but the conclusion that though it is true that original tendencies are delayed they are also very gradual in their maturing, is not invalidated.

They are transitory. — General psychology also teaches that instincts are transitory, that by the laws of their own development, uninfluenced by what happens to them, they will wane and pass away. The general implication of the discussion is, that these original tendencies are present and active but for a short time, and then pass, unless they are fixed as habits. Teachers are warned "to detect the moment of the instinctive readiness" for each subject, to "seize the wave of the pupil's interest . . . before its ebb has come so that knowledge may be got and a habit of skill acquired." The conclusion was that "most instincts are implanted for the sake of giving rise to habits, and that, this purpose once accomplished, the instincts themselves, as such, have no raison d'être in the psychical economy, and consequently fade away."[1]

Against this idea Thorndike points out that "Two forces other than the law of transitoriness, must be considered, before attributing the ebbs in man's activities so exclusively to it. The first is the force of new situations, — changed circumstances about man — rather than a changed nature in him. The second is the force of changes in his nature due to

[1] James, Principles of Psychology, Vol. II, pp. 401, 402.

special acquisitions — learned habits — not to mere losses of transitory instincts and capacities." [1] If the adult was surrounded by the same situations which surround the child, if society expected no more of him, — meted out its approval and disapproval as it does to the child, would he not exhibit many of the instincts and capacities that are supposed to be the heritage of the child alone, and to pass away? And again, the change in activities may be but the same fundamental instinct, perfected, turned into new channels because of the added satisfaction gained by such changes.

That these two factors rather than transitoriness of original tendencies do explain much of the difference between the activities of children and adults is proved by the fact that it is hard to find instincts that are transitory — that have really gone. Give them but the opportunity and the so-called childish interests and instincts appear in most adults. The play tendencies — the theaters, moving-picture shows, baseball and football games, bridge parties and dances prove their existence in the adult. The love of the mysterious — initiations into all sorts of societies and fraternities prove it still has its attractions. Interest in novelty and movements — the widespread interest in aëroplanes, and wireless telegraphy, the gorgeous displays of electric signs in the big cities, the rapid and extraordinary changes in styles of women's apparel, all these testify to the presence of this instinct for novelty and movement. How many adults are there who are not collecting or hoarding something? How many can endure a nudge or a disdainful look from a peer without feeling the throb of the pugnacious instinct? The migratory instinct still shows itself in the adult fondness for change of residence — witness "moving day" — and in his love of travel; fear of solitude, of snakes and large animals still persists despite the influence of training and experience. That inborn tendencies do unfold, flourish, and decay according to laws of

[1] Thorndike, Original Nature of Man, p. 265.

inner growth is undoubtedly true, but the unfolding is much more protracted and the decay much less perceptible than it has been customary to suppose. This is especially true of the common fundamental human traits and interests. If this is true, the educator can no longer shift so much of the burden of responsibility on to the shoulders of a Nature that brings possibilities on the stage of Life only to remove them. The traits, interests, and capacities that are necessary to form into character, conduct, and intellect are in the possession of every child for years; the responsibility for their use and development rests with the educator.

They are crude. — Another characteristic of original responses is their crudity. Children are often called "little savages," and so far as their inherited make-up is concerned, that is what they are. "Man's original equipment dates far back and adapts him, directly, only for such a life as might be led by a family group of wild men among the brute forces of land, water, storm and sun, fruit and berries, animals and other family groups of wild men."[1] The original traits and interests of man are not such as fit him to live in a civilized community in the twentieth century, and therefore the fact that these tendencies are modifiable is of tremendous importance. On this fact alone rests all the civilization of the world, all the culture of the ages, all the promise of the future. Here is the field and the function of education: to seize upon this capital and use it; to modify and direct the original capacities and instincts of children so that they are fitted to live in the best which adult society has to offer, to appreciate and to add to it.

METHODS OF MODIFYING ORIGINAL NATURE. — "The indiscriminate manipulation of objects is modified into instructive play with sand piles, blocks or ball; and later into intelligent use of tools, pencil, pen, typewriter, engine, printing press, and the like. Thus the satisfyingness which originally accompanies

How may instincts be modified?

[1] Thorndike, Education, pp. 91–92.

notice and approval by anybody is redirected to form special attachments to the approval of parents, teachers, one's own higher nature, and heroes, living and dead, who are chosen as ideal judges. Thus the original incitement of 'another trying to get the food or victory or admiration which we crave' is replaced gradually by rivalry with others in all work and play, then by rivalry with our own past records or with ideal standards. Thus out of 'collecting and hoarding at random whatever is handy and attractive to the crude interests in color, glitter and novelty,' habits of intelligent scientific collecting and arranging may be formed, and the interest in collecting may be made a stimulus to getting knowledge about the objects collected. Thus the original interests, the tendencies to be satisfied by and annoyed by, to like and dislike, are turned into acquired interests in efficient workmanship, kindly fellowship, the welfare of one's family, friends, community and nation, and finally into the love of truth, justice and the happiness of mankind as a whole."[1] The work of education is largely a matter of modification; few if any original tendencies are absolutely useless, few are so acceptable that they can be retained just as they are. The vast majority of them need to be modified, higher pleasures substituted for lower, certain elements eliminated by withholding the situation that calls them out when they will perish from disuse, or by following their manifestation with pain and discomfort of some kind, fixing the desirable traits or phases or elements by rewards or satisfaction.

By disuse or stimulation. — One method of controlling an instinct is to deal with the situation which evokes the response. The stimulus may be withheld to prevent the response recurring — illustrated in keeping dangerous but attractive objects out of a baby's reach, or it may be provided in superabundance so as to increase the likelihood of a response — illustrated by surrounding the kindergarten child with all

[1] Thorndike, Education, pp. 92–93.

sorts of suggestive implements. The former method, known as disuse, is obviously not a constructive way of training normal children, since no guarantee is given that the whole environment will be permanently emptied of such stimuli, nor is any provision made for teaching children how to respond when the inevitable situation is felt. In an emergency, or with very young, sick, or abnormal subjects the method of disuse may be necessary. For a rich, full life, the method of stimulation is always indicated.

By unpleasant or pleasant results. — A second method of control is to attach such consequences to the response that on a recurrence of the situation the response is either more or less likely to be made. Thus, love of being a cause, and manipulation are developed by the reward of seeing the object made or changed, and indiscriminate grabbing is checked by the pain of the burn or the slap that follows. In either case, the reward, satisfaction, pleasure feeling, or the punishment, dissatisfaction, pain feeling, needs to be closely associated in the child's own consciousness with the situation-response series rather than with accidental extraneous circumstances, or with the person who intensifies the affective tone of the results; also, the younger the child the more closely in time must the consequences be felt.

By substitution or sublimation. — A third method of control, known as substitution, attempts to reconstruct the situation-response series by forming a habit of responding in another than the primitive way whenever the situation occurs. Thus, when hungry and within sight, smell, and reach of food, children must learn to wait and help themselves in mannerly fashion rather than to grab, to eat rather than stuff and bolt their food, eventually to dine rather than to eat. A special form of this substitution method is known as sublimation. Here the emotional tone accompanying an original situation-response series is transferred to another complex and utilized in other, higher ways. Thus, the feelings of anger that might

assist in striking out when pushed or interfered with bodily may be directed into energetic fighting for a cause, through newspaper publicity, speeches in the legislature, or similar means. And the feeling of derision or repugnance that by original nature is present when looking at anybody physically grotesque, awkward, or deformed, may be transferred to the mental contemplation of anything morally ugly; while by substitution, the response of sympathy may be felt in the first situation and helpful action follow.

This stimulation or disuse, reward or punishment, substitution and sublimation as methods of awakening, strengthening, or redirecting original nature does not wait until the child reaches school age, but begins in earliest babyhood; however, the pull and power of original nature is still strong during the child's school years, and it is the business of the teacher to make use of the energy, the tendencies which are there. To ignore them is wasteful, and may be definitely harmful. They are there to be used, neither to be ignored, nor just accepted. That education which knows what an individual will do apart from training, which makes use of natural interests and motives instead of forcing artificial ones, which works with rather than against original nature, that education will succeed in satisfying the deepest, most lasting, biggest human wants.

REASONS FOR DELAYEDNESS AND TRANSITORINESS OF INSTINCTS. Recapitulation theory. — One explanation of the very widespread reliance and emphasis on the transitoriness and delayedness of original nature has been the general acceptance of the doctrine of recapitulation as the explanation of the order of development of instincts and capacities. The theory sets forth that the various instincts, powers, and capacities appear in the individual in the same order as they did in the race, their strength being determined by their age and their importance to the race. The following quotations

What is the theory of recapitulation?

express the theory as it has been held. Agassiz said . . .[1] " the phases of development of all living animals correspond to the order of succession of their extinct representatives." " The individual from conception to senescence, follows the order of development of the race." [2] . . . " the child ontogenetically recapitulating the phylogenetic development of the race craves communion with nature," [3] . . . " ontogenetic development is recapitulatory. Each individual passes through the stages through which its phylum has passed," [4] . . . " the child's development is only a condensed index of what took place on the larger plan of race history." " In play every mood and movement is instinct with heredity. Thus we rehearse the activities of our ancestors, back we know not how far, and repeat their life work in summative and adumbrated ways. It is reminiscent, albeit unconsciously, of our line of descent, — and each is the key to the other. . . . Thus stage by stage we re-enact their (our ancestors') lives. Once in the phylon many of these activities were elaborated in the life and death struggle for existence. Now the elements and combinations oldest in the muscle history of the race are re-represented earliest in the individual, and those later follow in order." [5] President G. Stanley Hall is the most ardent advocate of the theory in this country and all his writings contain references to it. It is practically the controlling principle in his discussion of Adolescence in the two-volume book of that name.

Evidence stated and criticized. — The evidence offered for the belief that " ontogeny recapitulates phylogeny " may be grouped under three heads. First that relating to physical recapitulation and derived largely from embryology.

[1] F. L. Burk, From Fundamental to Accessory in the Development of Nervous System and of Movements, Ped. Sem., Vol. 6, p. 36.

[2] F. E. Bolton, Hydro-Psychoses, A. J. P., Vol. 10, p. 227.

[3] G. E. Dawson, Psychic Rudiments and Morality, p. 189.

[4] J. W. Slaughter, The Moon in Childhood and Folk-Lore, A. J. P., Vol. 13, p. 294.

[5] G. S. Hall, Adolescence, Vol. 1, pp. 202, 203.

The claim is that as the growth of the body follows race development that of behavior does also. "The essential stages of human development resemble those of other animals. . . . But so close are the resemblances among the early embryonic stages that the differences are almost unrecognizable. Some one has said that for some time no one would be able to tell whether a given embryo might turn out a frog or a philosopher." [1] Romanes says that when man's "animality becomes established, he exhibits the fundamental anatomical qualities which characterize such lowly animals as polyps and jelly-fish. And even when he is marked off as a vertebrate, it cannot be said whether he is to be a fish, a reptile, a bird, or a beast. Later on it becomes evident he is to be a mammal, but not till later still can it be said to which order of mammals he belongs." [2] It is told of Professor His, that on viewing a slightly abnormal embryo, known to be human, he "asserted roundly that Krause (who had shown it), must have made a mistake, and that his specimen was a chick and not a human one at all." [3]

What reasons are suggested in support of this theory?

That there is some likeness between the human embryo and those of lower animals seems incontrovertible, but expert biologists of to-day do not find the close identity that these quotations claim exists. Thorndike in summing up their opinions says: "Only in rough outlines and in the case of a fraction of bodily organs does nature make an individual from the fertilized ovum by the same series of changes by which it made his species from the primitive protozoa. . . . No one would mistake the human embryo at any stage for any adult fish or reptile or mammal. No one can tell from ontogeny what the phylogeny of man has been in the great changes from invertebrate to vertebrate, from early generalized mammal to primate,

[1] F. E. Bolton, Principles of Education, p. 70.
[2] Darwin and after Darwin, Vol. 1, p. 119.
[3] Marshall, Biological Lectures and Addresses, p. 250.

from early primate to man." [1] It is also true that if behavior recapitulates race history, then the part of the body upon which it depends, namely, the nervous system, should show the clearest signs of recapitulation, and this is just the part that shows the least likeness to such an order. The course of development of an individual's brain does not coincide at all with its course of development in the race; how then is it possible for instincts or capacities to recapitulate at all closely the order of manifestation in the race? Moreover, at birth, a human brain has long passed any stage that could possibly be called fish or early mammal. Why then try to trace in infancy, or in still later years, recapitulations of aquatic life when the organ governing behavior, the brain, is not at that same time at all like that of the fish? It must also be borne in mind that even if there were exact parallelism between the development of the human embryo and that of the lower animals, recapitulation would not be proved. The embryo must develop somehow, and it seems extremely likely that in nature there has been evolved a general method for the development, the easiest and most economical; and that because it is a general method, traces of it can be found all up the animal scale. This is borne out by the fact that in instances where recapitulation seems clearest, the way taken for the development is the most simple — most economical, apart from any tendency towards recapitulation.

A SECOND line of evidence of much less importance is adduced from vestigial structures in man, and from the so-called "survival movements." Bolton claims that upwards of one hundred and thirty of these vestigial structures have been discerned. The gill slits, the vermiform appendix, the muscles by means of which the external ear is moved are among those most often quoted. The survival movements may be illustrated by the peculiar paddling or swimming movements, and the grasping and clinging movements which very young

[1] Thorndike, Original Nature of Man, pp. 254–255.

babies make. The same answer may be made here that was made above. Even if a general method of development does not account for their presence, still such bodily analogies have no bearing on recapitulation of behavior.

A THIRD line of evidence offered from genetic, social, and pathological psychology instances many superstitions, fears, customs, and other psychoses which suggest ancestral minds in the same way that vestigial organs in the body suggest earlier physical forms. As noted above, the brain at birth, and therefore mentality, is distinctly human; consequently we may ignore delvings into any more remote past than that of our earliest human ancestors. Here the phenomena are less capable of proof or refutation than are the purely physical. The same argument holds, however, that the order of development or regression may be the most simple or the most useful; it may be added, too, that perhaps were all the attendant circumstances thoroughly understood the present situation is ample explanation of the particular response called out. Children's interest in fairy stories, rather than recapitulating human superstition, comes at a time when their eager receptivity makes them credulous of all sorts of wonders and marvels before the touchstone of experience can have distinguished the possible from the impossible. The infant's dislike of, and fright at touching his mother's fur stole or the family cat may be explained not by any inherited memory of unfortunate racial contact with a mastodon, but by the unusualness of the skin stimulus, the odor of the fur, or the uninterpreted expression of pussy's eyes, whiskers, and tail, let alone the feel of her nose or claws. The timidity of some older people when having to cross a large open space or when standing on high places need not be accounted for by any savages' habits tending to self-preservation, but by a social self-consciousness, or the individual's own experiences with swift-moving vehicles, falls, vertigo induced by slow eye focus, and the like.

Of course, the most obvious proof for the theory should come through observation; do children in their development show traces of passing through the fish stage, the lower mammalian stage, the primate stage, etc., through primitive man? Obviously they do not. No one has been able to segregate the years or months in a child's life when he was recapitulating any stage of racial development, and all attempts have resulted disastrously to the theory. The new-born infant shows characteristics such as paddling movements that have been traced to the fish stage, and others such as clinging by the hands that certainly belong to the primates. An eleven-year-old boy enjoys the water like a mud turtle, scampers on the rocks like a goat, climbs trees like a chimpanzee, inhabits caves like a prehistoric man, builds wigwams or snow-forts like a savage, parades with drum and fife like a twentieth-century militant. He may practice with bows and arrows or water pistols; he may model a water-wheel, mix concrete, or even set up a wireless outfit. Which stage can he be said to be duplicating? Is he kid, monkey, barbarian, or plain boy? Moreover, love of the water and of climbing hills is found in the twenties and forties as well as in the early years, facts difficult to reconcile with the recapitulation theory, as is also the lack of correspondence in the race and in the individual of the relative time of appearance of grasping, talking, and the sex instinct.

Derived culture epoch theory. — Yet the advocate of the culture epoch theory, a derivative of the theory of recapitulation, would urge avenues of approach to children determined by the epoch of culture through which they are supposedly passing. In the hunting stage, nomadic, agricultural, urban, and so on, children must be told stories of corresponding stages of culture, and see or make implements belonging to that stage. But to city children of to-day a stone plow is no more familiar than a modern tractor, nor a birch-

Shall we select curricula on the basis of the culture epoch theory?

bark canoe than a motor launch or big ferry; while an automobile is certainly better known than a camel or other primitive means of transportation. The doings of Hiawatha, or Aryan, Greek, Roman, and Saxon boys, or of Robinson Crusoe are undoubtedly interesting, but so are those of contemporaries. The applications of the doctrine of apperception suggest that the familiar and the simple are good points of contact rather than those early in the racial chronology. Moreover, the practical difficulties of presenting material to all first-grade children, or all second-grade where the ages vary by as much as two or three years, emphasize the fact that we may err in seeking in the presumable epoch corresponding to the children's development for culture material, rather than utilizing the obvious, everyday things in their environment. As Bolton says, the "telephone and the postal system are quite as comprehensible to a modern boy as the means of communication in vogue ten thousand years ago. . . . To be sure, the boy does not comprehend the philosophy of all these modern processes, what he sees are externals. . . . Complexities of life exist all about the child, but he responds only to that for which his development has attuned him. Later on he becomes fitted . . . to vibrate in harmony with a more complex order of things, — but not necessarily those things only which have come within ancestral experience."[1]

As fields for speculation, both the doctrine of recapitulation and the culture epoch theory offer interesting material; but as guides in the interpretation of child life and in the planning of school courses both are unsatisfactory.

Utility theory. — A second theory which is being offered to explain the order of development of original tendencies is the utility theory. Thorndike says,[2] "Other things being equal, the date at which a tendency appears is that one of the many varying dates at

What is the utility theory?

[1] Bolton, Principles of Education, p. 114.

[2] Thorndike, Original Nature of Man, p. 252.

which it has appeared in our ancestry which has been most serviceable in keeping the stock alive." The two factors of variation and selection account for the order of the appearance of the tendencies just as they account for their existence. The evidence for this theory is very scanty, due to the fact that the testing of it has only just begun. It does seem true, however, that in cases of delayed instincts when the order is in opposition to that of racial development, it is in the direction of the useful order; for instance, walking erect precedes climbing trees. On the whole, too little is known of the actual equipment of man in terms of original nature as well as the dates of the appearance of such tendencies to make it safe to consider any theory verified. Such verification must depend on added knowledge.

The point of view of this book so far has been to emphasize the fact of original nature, its dependence on family, sex, and race, and its importance from the standpoint of education, both as a limitation and as capital. Not only, therefore, is it necessary for the educator to have knowledge of what man starts with, but also of what changes take place in this original equipment, and how such changes are brought about. It should be understood that the discussion of any and all of these points must be incomplete and tentative. As to what man's original equipment is in terms of instincts and capacities psychologists are not at all agreed. Neither are they agreed as to the changes that take place, — how, for instance, a five-year-old differs from a ten-year-old in memory. Methods of bringing about changes in the nature and attainment of children are but now being subjected to scientific study. Therefore all future treatment and discussion must be taken in the light of this limitation of knowledge.

The child's original equipment and the changes which take place in it will be the subject of the next eight chapters. The discussion will be under three divisions: 1. Original tend-

encies which result primarily in action. 2. Original tendencies accompanied by affective states. 3. Original tendencies which result primarily in mental states, such as attention, perception, memory, imagination, and thinking.

Questions for Discussion

1. Give instances which seem to show, (*a*) the transitoriness of capacities, (*b*) the length of life of instincts or capacities.

2. Give approximate ages for the appearance of, or chief interest in, the following: (*a*) walking, (*b*) herding with members of the same sex, (*c*) dressing dolls, (*d*) making mud pies, (*e*) roaming the woods, (*f*) watching bright moving objects, (*g*) self-display, (*h*) interest in babies, (*i*) vocalization.

3. Illustrate the use of the instinct of manipulation in the work of the primary grades, the grammar grades, the junior high school.

4. What are the points in favor of substitution as a method of modifying instincts?

5. What changes in the elementary school program would be caused by an utter rejection of the culture epoch theory?

References for Reading

James, *Principles of Psychology*, Vol. II, ch. 24.
Thorndike, *Original Nature of Man*, Vol. I, chs. 2, 14, 16.
Bolton, *Principles of Education*, chs. 4, 5, 6.
Kirkpatrick, *Fundamentals of Child Study*, ch. 3.

CHAPTER III

TENDENCIES RESULTING IN ACTION — NON-SOCIAL INSTINCTS

It should be borne in mind that the divisions suggested in the last chapter under which the original tendencies will be discussed are not sharply defined. Of necessity they overlap continually, for action, conscious mental states, and affective states occur as responses to almost all the situations in life. The tendencies listed under the first head will often be accompanied by both intellectual states and feeling, and the same fact is true of each of the other divisions. However, for convenience in discussion, it is possible to make such a division; for tendencies in their original form may primarily concern action or intellect or feeling. The appearance of any tendency in any one group does not in consequence exclude it from any other, and, in following out a tendency, excursions into either of the groups may be a necessity.

What non-social tendencies should the teacher consider?

The tendencies which result primarily in action include many of the so-called instincts of general psychology. James defines an instinct as a tendency to act in a given situation without experience or pre-knowledge of the result. These tendencies to act as caused by original nature may be divided into two groups, the *non-social* instincts — those which manifest themselves in situations made up of material objects — and *social* instincts, those whose exercise depends on the presence or behavior of other human beings. It would be impossible in a book of this size to discuss all these tendencies to action;

therefore the following list is but a partial one, only those of importance to the educator having been chosen.[1]

Of the non-social tendencies, the following are important: 1. General physical activity — made up of movements of gross bodily control, vocalization, visual exploration and manipulation; 2. Food-getting and hunting; 3. Teasing; 4. Ownership and collecting; 5. Fighting.

GENERAL PHYSICAL ACTIVITY. Bodily movements. — The instinct of physical activity shows itself from birth on, in numerous spontaneous and involuntary movements which involve all parts of the body. During his first two years we find a child " holding up his head, sitting, standing, walking, running, stooping, jumping up and down, leaping at, crouching, lying down, rolling over, climbing, dodging, stooping to pick up, raising himself again, balancing, clinging, pushing with arms and with legs, pulling with arms, throwing, kicking, grasping," and so on through an almost endless series of movements which use all the muscles in the body. That these movements are unlearned, and the child's management of his body is a result of original tendencies seems to be more and more the opinion of experts in child study. It is difficult to see how it could be otherwise, dependent as the human race is on original equipment for the initial impetus in all directions. The fact that it has been a common practice to speak of " teaching children to walk " is due to the imperfection of the first manifestations of these tendencies, and the gradualness of their maturing has tended to hide their instinctive nature. That opportunities for exercise and the resulting pleasure or pain of this exercise have their effect in bringing about control is undeniable, and it is the duty of the educator to furnish both; but the presence or absence of these various types of bodily movement is dependent primarily upon connections in the nervous system, and not upon teaching. In fact, the forcing of the baby to stand or

[1] For a fuller discussion, refer to Thorndike's Original Nature of Man.

walk by fond parents or proud nurses may be harmful rather than helpful.

"*Fundamental to accessory*" *theory.* — Granted that these tendencies are present as part of original equipment there arise two questions of importance to students of children: first, "Is there any definite order in which control is gained?" and second, "Is there need for a fuller recognition of this instinct of general physical activity?" In connection with the problem stated in the first question much has been written. If these movements have their roots in original nature, it follows that no movement or series of movements can come under the control of the child until they have been experienced by him as the result of the functioning of his nervous system — that they must be "blind" and "non-voluntary" before they can be voluntary. Control, then, is dependent upon the maturing of connections between neurones whose action results in these various movements.

How does a child gain control of his movements?

A theory which has had wide acceptance is that the development is from the fundamental to the accessory muscles. But the theory has meant different things to different writers. Hall says, "The former designates the muscles and movements of the trunk and large joints, neck, back, hips, shoulders, knees and elbows, sometimes called central, and which in general man has in common with the higher and larger animals. . . . The latter or accessory movements are those of the hand, tongue, face and articulatory organs. . . . They are represented by smaller and more numerous muscles, whose functions develop later in life and represent a higher standpoint of evolution."[1] These last two phrases interpret the theory in accordance with the doctrine of recapitulation, but emphasize the mere size of the muscles. A second view is expressed by Bolton: "In a general way, by fundamental we mean also that which is vital and necessary to existence.

[1] G. S. Hall, Youth, p. 9.

By accessory we mean that which is less vital and in a way less necessary to existence." [1] A third interpretation is that within any series or group of coördinated muscles the larger ones mature first, and the smallest ones last. A fourth view expressed by Shepardson is that the voluntary purposive control of muscles is from those that are oldest in the race to those that are youngest.

In direct contradiction to the first theory are such facts as these: the development of the movements of grasping with the fingers and curling the toes in a very young infant; children pick up pins, tacks, and other small objects before they walk; babies have control of eye movements, and can follow a light long before they use their trunk muscles to sit up; the existence of infant prodigies, whose performance requires the finest type of adjustment and coördination of small muscles, which is a proof of the maturity of the centers controlling the accessory muscles. The fact expressed by the second theory, that the muscles controlling vital operations are developed before those not necessary to life, is undoubtedly true. The digestive, circulatory, pulmonary acts are fairly perfect at birth, long before the coördinations of the muscles of the fingers or legs are perfected; but these are reflexes, and as the theory is brought forward in connection with the question of voluntary control this interpretation does not add anything.

For the support of the third view, that within coördinated series of muscles and muscle movements the progress is from large to small, some experimental evidence is offered. Bryan,[2] in his tests of the voluntary control of the muscles of the shoulder-finger series in children from six to sixteen years of age, finds that the shoulder muscles show the greatest maturity and the finger coördination least in children of six, but

[1] F. E. Bolton, Principles of Education, p. 120.

[2] On the Development of Voluntary Motor Ability, A. J. P., Vol. 5, pp. 125–204.

that the finger muscles gain in rapidity and precision of action after nine or ten years of age. Hancock,[1] in his experiment testing control, comes to relatively the same conclusion; *i.e.* that the order of control is body, shoulder, arm, forearm, and hand, and that movements requiring large muscles are more easily learned than those involving small ones. The evidence is not conclusive, for there is no definite period of ripening found for the shoulder muscles; they continue to improve up to sixteen years just as do the finger movements, only the rate is somewhat slower. Also it is to be noted that the rate of improvement in the different tests varies, a result that seems hard to explain if the maturing is due simply to a law of inner growth.

The fourth view, that expressed by Shepardson,[2] seems to be the one most in accord with the facts known. An observation of children's plays shows that in the spontaneous muscle movements made then the larger muscles play a major part, — the smaller muscles within a series coming into use later; and that when movements are willed, those involving the larger muscles within a series require less effort than do the smaller coördinations. The practical outcome of the theory, even though it is not tenable in its original form, is to emphasize the value of large movements for little children, and to suggest the economy in both time and effort in the postponement of movements requiring fine coördinations. It also emphasizes the need of spontaneous, free exercise of all movements before the voluntary, purposive use of them. In his free play, the child should have used again and again the fine coördinations before he is required to make them in connection with school subjects. Many of the changes which have been so worth while in the materials used for instruction in the kindergarten and primary grades have been due to the application of this theory.

[1] A Study of Motor Ability, Ped. Sem., Vol. III, pp. 9–29.
[2] A Critique of the Doctrine of From Fundamental to Accessory.

Provision for activity. — The second question, as to whether enough allowance is made for the strength of this tendency of physical activity, can be answered emphatically in the negative. The little child is a bundle of activity, asleep or awake, and as a rule is in almost constant movement. Nerve currents which later will work themselves out in terms of mental states now result in movement. Curtis found that the very young child cannot sit motionless more than thirty seconds, nor children from five to ten years for more than one minute and a half. Another observer testing the automatic swaying movements in children found them to be from four to six times as great as those in the adult. It is difficult for an adult to understand the amount of effort, of nervous energy required in a young child to inhibit all the tendencies to movement which are present. One of the most exhausting things one asks him to do is to " sit still and play quietly," and yet we ask it as though it were nothing, not realizing the draft it makes on his store of energy. The kindergarten has recognized this need of the child for freedom of movement, but the primary school still falls far short in providing for this side of child nature. This instinct is implanted in the child to be used, not suppressed. What society needs is primarily an able-bodied, well-developed healthy little being, and it is by means of the use and development of this instinct that such a result is possible. As Gesell says, "Why shut children up in the prisons which we have made for ourselves out of inhibition and conventional standards?" To make them old men and old women before their time is not only to lose the charm and joy of childhood, but to sap the vitality of the race.

Is it natural to " keep still "?

Vocalization. — " A little child, apart from training, makes all sorts of movements of the vocal cords and mouth-parts resulting in cooings, babblings, yellings, squealings and squawkings of great variety," which make up the stuff in terms of original nature from which language is developed. This variety of vocal expression is

How does talking develop?

not the first manifestation, but one undifferentiated cry is probably the only expression for at least the first two weeks. Before the fifth week, however, the primitive squall is differentiated into special cries, denoting hunger, pain, anger, etc. From this point, differentiation proceeds rapidly. The cooings and gurglings of babies of all nationalities seem to be the same during this period of spontaneous vocal play. The different languages emerge from the same root stock of vocal sounds by means of the laws of exercise and effect. The sounds that are noted and rewarded, those which result in satisfaction to the child, are fixed in him. The language which the child speaks, if it be a language at all or only baby talk, depends entirely on the way the vocal manifestations are received by the adults in the child's environment. The child's progress in the field of language depends on the two factors of necessity and reward. The little girl who at five could not talk at all because her sister had always talked for her is a case in point.

As a general rule, intonation, inflection, and accent are noticed by children and responded to earlier than are words; it naturally follows that these are also the first elements of language acquired by the child. The question as to the kinds of words earliest learned by children is a difficult one; there is no absolute agreement in answer between experts in child study. The consensus of opinion seems at present to be that the first words are " sentence " words, the exact meaning of which is made clear by intonation, gesture, etc.; the substantive and predicate functions are not differentiated, such indiscriminate use being later corrected as need arises. Following this stage come adjectives, appropriate use of adverbs, various tenses, and last of all certain prepositions, conjunctions, and pronouns.[1] Sentence making proceeds as exigencies require, progress resulting from " (1) the substitution of

[1] For a full discussion of this topic see O'Shea, Linguistic Development and Education.

words for what is understood or indicated by tone or gesture; (2) analysis of situation into separate elements which then are expressed by words; (3) increase of mental grasp so that the relation of different elements to each other is held in mind, and words selected and arranged to express that relation." [1] The size of children's vocabularies and their control of language construction at any age, vary tremendously, *e.g.* from a score of words to fifteen hundred at the age of two. Some four-year-olds may use better constructions than some twelve-year-olds; so much depends on what they hear. From a practical point of view, the importance of the method of trial and error and the laws of exercise and effect for the young child, the added factor of good examples for the older child are worthy of emphasis. Likewise, the fact that oral, must precede visual, or written, language should not be overlooked.

Manipulation. — The tendency towards manipulation is another manifestation of the general instinct of physical activity. A child pulls, pats, tears, fingers, pokes, rubs, turns, rolls, squeezes, drops, picks up, waves, throws, etc., any object that permits it. His facility in the use of his fingers and his thumb in opposition to them as a matter of original nature is the explanation of man's skill and technique in all the arts and industries. These movements are as spontaneous and motiveless as the grosser bodily movements previously discussed; they are neither constructive nor destructive, although the child may learn to be either. That the fund of energy furnished by this instinct as well as the possibilities offered should have been practically ignored in our schools for so many years seems almost incredible. It is only comparatively recently that the education of the hand has formed a part of the school curriculum, and in fact in certain sections of the country it is only now beginning to be considered. The value of handwork need not be discussed here, but from the standpoint of child

What instinct is a basis for handwork?

[1] E. A. Kirkpatrick, Fundamentals of Child Study, p. 234.

psychology, it is evident that to ignore this part of an individual's capital is wasteful.

Certain principles are worth noting. First: large, coarse movements should precede small, fine ones.

Second: such materials as sand, clay, wooden blocks, heavy cord should precede the use of implements such as scissors, brush, crayon, pencil, and sewing materials.

Third: content precedes form, — doing something precedes the interest in how it is done. For example, a piece of handwork may be done with any one of three motives in mind, (*a*) to tell something, (*b*) to represent something, (*c*) to make something beautiful or perfect; and in this order the motives should be appealed to, mere technique coming last.

Fourth: originality of performance follows a variety of experiences and an increase of technique, and it should not be required until many concrete examples have been presented. These last two principles apply to work in language and composition just as truly as to handwork.

FOOD-GETTING AND HUNTING. — Food-getting is one of the first instincts to manifest itself. The early forms are the sucking movements and the movements of the head in seeking the breasts, the various mouth, throat, and face movements according to whether the substance tasted is sweet, sour, or bitter. As the child grows older, the reaching, grasping, and putting-in-the-mouth movements are added. These movements are quickly involved in the instinct of general physical activity and manipulation, although for about a year and a half the tendency of the baby to put everything in his mouth is a source of anxiety to the mother and nurse. Because of the civilized community in which children are born the original tendencies are soon overlaid by definite "manners" in connection with food-getting, but the interest in food is one of the chief interests of childhood and remains strong throughout life. Kirkpatrick says it reaches its height about six when,

How is the food-getting instinct shown?

because a child is eating all sorts of foods, his varied experience has given him a basis for knowledge or choice. There seems to be no valid reason why this love of good things to eat should not be appealed to as a legitimate motive in dealing with young children. It is a natural interest, one of which there is no need to be ashamed, and one of tremendous dynamic power. Of course, as other interests appear, appeal to this one alone is no longer wise.

Allied with the food-getting instinct in primitive man was the hunting instinct. No particular need of the hunting instinct exists any longer, but the original tendency persists. Thorndike describes it as follows: "To a small escaping object, man, especially if hungry, responds, apart from training, by pursuit, being satisfied when he draws nearer to it. When within pouncing distance, he pounces upon it, grasping at it. If it is not seized, he is annoyed. If it is seized, he examines, manipulates and dismembers it, unless some contrary tendency is brought into action by its sliminess, sting, or the like. To an object of moderate size and not of offensive mien moving away from or past him man originally responds much as noted above, save that in seizing the object chased, he is likely to throw himself upon it, bear it to the ground, choke and maul it until it is completely subdued, giving then a cry of triumph." [1] Whether there are specialized forms of the hunting instinct, such as hunting for birds' nests and eggs, or inserting the fingers in small holes and crannies, is still a disputed question. This instinct to hunt and subdue animals or other human beings weaker than himself is still seen in civilized man. It is evident in many children's games, where pursuit and capture is the chief element. In adults, it is seen in the fondness of many men and some women for hunting as a sport, in the tracking instinct of the detective, "in the hounding of Quakers, abolitionists, Jews, Chinamen, scabs, prophets, or suffragettes of the non-militant"

[1] Thorndike, Original Nature of Man, p. 52.

variety." The energy is here as a part of the natural equipment of every individual. It is the business of the educator to see that it gets proper opportunity for exercise in the harmless plays of childhood, and that it is diverted into such channels that in the adult it may work in the cause of justice and of service to the community.

TEASING. — Teasing and bullying are original tendencies which are allied to both the hunting instinct and the instinct of manipulation. These two tendencies when evoked by animals or persons unwilling or unable to protect themselves are the roots of the so-called "cruelty" in children. When it is primarily the instinct of manipulation, poking, pulling, punching, slapping, etc., manifested toward some one who does not "play back," the whole response is called teasing. Adults and pet animals who do not respond by energetic mastery suffer much at the hands of young children in this way. Older children choose other children as their victims. When it is the hunting instinct and manifested toward a weaker individual, it is called bullying and may be carried to great lengths by individuals of a mean nature. Teasing in moderation is thought to be good both for the one teased and the one teasing, as it tends to arouse initiative; but if exercised unduly or habitually, it is apt to degenerate into bullying. Bullying is possibly the one original tendency that seems wholly bad. It is difficult to discern in it any element of good, and its uprooting, or the substitution of one of the kindlier, more helpful tendencies for it must be one of the duties of every teacher. Its persistence in adult life results in much harm and unhappiness. The brutality of the strong towards the weak, the misuse of power by governments, the refinement of cruelty shown in sarcasm and covered taunts, all find their explanation in this original tendency. Children cannot be held responsible for its existence in them, for it is part of their inherited equipment. They are not degenerate when they tease or bully,

To what other tendencies is teasing similar?

but for the good of society these tendencies must be modified and changed.

OWNERSHIP AND COLLECTING. — The instincts of ownership and collection are two non-social tendencies closely allied. There is a tendency in every child to approach any attractive object, seize and carry it off if it is not too large. At a later age, such objects are put together in some convenient place, looked at in the mass, fingered and perhaps arranged. These objects gather value simply because they are possessed, and aimless collecting and storing of all sorts of valueless objects becomes a habit. Other instincts, such as manipulation, curiosity, rivalry, are aroused in connection with the possessions. Kline,[1] in his investigation of the instinct of ownership, says that the first objects to be claimed are those instrumental in satisfying hunger; in the second group are those that administer to bodily comfort, such as " mother's lap " and a " special chair," etc.; in the third group are articles of motion and articles of dress, followed by articles used in imitative plays. This tendency, which originates as a blind one to grasp and keep anything attracting attention, soon resulting in a child's claiming his bottle, his crib, his toys and clothes, develops into one of the strongest governing forces in civilized life. The mere fact of ownership or possession is enough to make one exert all one's powers to retain acquisitions. One's ingenuity is never more taxed than when desirous of possessing some object be it article of adornment, something ministering to a hobby, a job, or a piece of information. Everything in life may be claimed and is claimed by this instinct, and the pursuance of " my " in any situation adds a power that is difficult to measure. It is " my " home and possessions, "my" family, "my" friends, "my" reputation and interests, " my " business concern, " my " town, "my" state, "my" country and the same sense of posses-

Why is it worth while to train the collecting instinct?

[1] The Psychology of Ownership, Ped. Sem., Vol. VI.

sion often spreads so that it includes opinions, principles, ethics, and religion.

Training needed. — This tendency to reach out, to possess, to hold, often hinders good judgment and obscures the issues of life. It is frequently antagonistic to the social instincts of sympathy and kindliness; and because of these facts, teachers have usually refrained from appealing to it, have ignored its existence as far as possible. Nothing could be a more unwise treatment. Its very strength and persistence make such a manner of dealing with it futile, indeed often harmful. As a natural tendency it necessarily precedes the social instincts. One's value as a citizen depends on one's possessions, not only material, but intellectual and spiritual as well. An individual must have possessions worth while, must be something worth while, before he will be much worth while to others. The instinct of ownership is the necessary foundation for all personal value. It should then be appealed to, made use of in the home and school. It is a perfectly legitimate motive, and a valuable source of power. True, an adjustment is necessary between this non-social and sometimes anti-social tendency and the social tendencies; but this adjustment comes only through much experience and teaching. Modification of the first crude tendency comes about as the child claims possessions of greater and greater value, from the physical and material to the spiritual, and as he learns that possessions in common are often worth more than those purely individual.

Changes with age. — The collecting of perfectly valueless articles is a strong tendency in childhood, and one not transitory. Miss Burk [1] found it present at six years of age, and to be present as far as she tested, through seventeen, though the time of greatest prominence seems to be between nine and ten years of age when the average number of collections per child is 4.4. The thing collected seems to depend largely on

[1] The Collecting Instinct, Ped. Sem., Vol. VII.

the environment, this instinct at first being merely to hoard something or other. The next stage involves rivalry — and the aim becomes to outstrip others in point of numbers in the collection. In the third stage, some attention is paid to arrangement and order; but at no time is the inherent value of the object an important factor. It is found that objects of nature precede both literary and esthetic objects as materials for collection. The strength of this tendency in childhood and the fact that it is still present in so many adults — witness the collections of string pieces, bottles, boxes, corks, bags, hats, etc., as well as those of hunting trophies, stamps, coins, rugs, china, art objects, etc. — suggest that the schools would do well to use the instinct more. An indefinite tendency — that fact in itself gives any environmental force great power in directing it. Emphasis must be laid on the arrangement of the material and the criticism as to the value of the things collected for the purpose held in mind. Only so can we train into scientific method and utilize this tendency for constructive social work. It has been used somewhat in the intermediate grammar grades in connection with nature study and home geography, but even there it might be used further. In the upper grammar and early high school it could be appealed to in connection with vocabulary study, either in English or a modern language, in the collection of facts of all kinds in the study of literature and history, as well as in the study of the arts and sciences. Every use of one of these original tendencies is economy, and much more could be done in this direction than has thus far been worked out.

FIGHTING. — The instinct of fighting, pugnacity, is one of the strongest original tendencies possessed by the human race. It is stronger in men than in women, but it is present in all normal individuals. It is a secondary instinct, in that it presupposes the presence of other instincts. McDougall, Kirkpatrick, and Thorndike all agree that it is aroused when any other instinc-

How may the fighting instinct be aroused and directed?

tive tendency is thwarted. Because it is dependent on the presence of other instincts in themselves essentially differing from each other, the fighting instinct is aroused by many different situations, and the responses must therefore be varied. Thwarting the instinct of physical activity, as when a baby is held, arouses the fighting instinct which manifests itself in a definite way. Thwarting the instinct of curiosity, of hunting, of collecting, of self-display, of mastery, or of sex in each case brings a response in terms of fighting; and that response must be different because of the difference in the stimulus. This fact makes it one of the most general as well as one of the most variable of the original responses of action. It shows itself in the very young baby in screaming, pushing away, kicking, writhing, etc. It shows itself in the older child in crying, running away from or towards, dodging, kicking, etc., and in the boy of eight or nine in the regular hand-to-hand fight, depending in each case on the cause for the particular manifestation. The attitude taken by adults towards this tendency is one of intense disapproval. Boys are put on their honor not to fight and are punished if they do. Granted that this tendency does bring much trouble both to the boy and his parents, is it wise to try to stamp it out by such means? Is it wise to stamp it out at all? McDougall says, " The instinct of pugnacity has played a part second to none in the evolution of social organization, and in the present age it operates more powerfully than any other in producing demonstrations of collective emotion and action on a great scale." [1] Again, in comparing the peoples of Europe and those of India and China, he says of the two latter, " The bulk of the people are deficient in the pugnacious instinct; they are patient and long suffering, have no taste for war, and, in China especially, they despise the military virtues. At the same time they seem to be deficient in those social qualities which may be summed up under the one word ' conscientiousness,' and

[1] Social Psychology, p. 279.

which are the cement of societies and essential factors of their progressive integration." [1]

Training needed. — If this is true, and there is every reason to believe it, this crude, often cruel, instinct has in it possibilities of development which make for coöperation, group-spirit, and moral fiber. The social instincts are then dependent to some extent on this individualistic, non-social root. The trouble with parents and teachers often is, that they want to omit the first crude stage of the tendency and come at once to its higher levels; but on logical grounds alone, it is hard to see how, if a boy has been required to inhibit such pugnacious tendencies on the physical level, he can later on fight for country or friends or principles. He has not known what it means, when thwarted, to stand for his wishes and rights; he has not known the sweets of success or the shame of defeat; he has not known what it means to suffer for the sake of gaining something that seems worth while. The door has been shut on all this opportunity when first the instinct was strong; how then can we expect him later on to fight his difficulties, take his stand for the right, to suffer for it if need be? As well expect a spoiled child who has always had his own way to be generous, or one who has never heard music to appreciate a Beethoven sonata. As in other instances already discussed, the tendency is there to be used, not to be merely suppressed. It is possible that women would not be so open to the criticism of being "lacking in honor," "of not understanding fair play," or being sneaky and underhand if this tendency had received proper treatment in childhood. Fighting, real physical combat, is a good thing for girls as well as boys, but that is only a starting point. The tendency needs modification. The child needs to learn not only to fight for his own rights, but for the rights of others; he needs to learn to be generous in the interpretation of his rights, and to submerge his interests in those of the group, — to learn coöpera-

[1] Social Psychology, p. 291.

tive pugnacity. The situation arousing the fighting instinct and the response itself should pass from the physical to the spiritual level. Inhibition must be taught in connection with it so that the child learns self-control. Not disuse, nor suppression by punishment, but graded substitutions leading to sublimation is the necessary treatment.

The over-manifestation of the tendency is usually due to an environment that is not satisfying the normal demands of the growing child. Some instincts have been continually thwarted by the conditions in which the child has spent his time, and therefore the pugnacious instinct has been aroused. True, its manifestation may be delayed because of fear, but, released from that, it appears. A schoolroom where the instincts of curiosity, love of approval, mastery, and physical activity are thwarted all day long is a hotbed for the pugnacious instinct; children released from such a room are ripe for trouble. Give the natural powers of the child opportunities for normal exercise, use a little tact in dealing with the unusually pugnacious boy, and the fighting evil will almost disappear. An eighth-grade class in a Massachusetts town had to pass judgment on the case of one of its members, continually in trouble because of his fights on the way home from school. He was a vigorous, active lad and his classmates decided he "didn't have enough to do"; so they sentenced him to punch a hay bag in the basement of the school for ten minutes every day before he went home. The boy was reformed, for the instinct of physical activity worked itself off before the boy met others on the way home, and therefore the temptation was removed. The same end might have been gained without the energy being wasted; but more of just such ingenuity in diagnosing is needed in dealing with all these non-social instincts if their full value is to be realized.

Exercises

1. Give, or collect, examples of the late development of the use of compound tenses, adverbs, pronouns, conjunctions.

2. Trace the stages necessary in transforming original food-getting tendencies into table manners. How might schools help in directing this instinct?

3. Do the same, in detail, for the fighting instinct.

4. Observe instances of the fighting instinct in:

(*a*) Adults in a crowd.

(*b*) Young children or animals held against their will.

(*c*) People when aroused by fear.

How do the responses differ?

Questions for Discussion

1. How is teasing different from play?

2. Did you make any collection as a child? If so, of what, and at what age? Why was it interesting? Has it led to anything useful?

3. Instance changes in methods and materials used in teaching little children that have been made in consequence of the formulation of the "fundamental to accessory" theory.

4. Name plays and games that utilize any or all of the tendencies discussed in this chapter.

References for Reading

Thorndike, *Original Nature of Man*, chs. 6, 10.
Bolton, *Principles of Education*, ch. 7.
O'Shea, *Linguistic Development and Education*, chs. 2, 3, 4, 5.
Burk, *Ped. Sem.*, Vol. 7, pp. 179–207.

CHAPTER IV

THE SOCIAL INSTINCTS

In this group of the so-called Social Instincts, the stimulus is the presence or behavior of some human being. A situation devoid of human beings could not carry out any of these responses. This was not true of the former groups. As has already been indicated, the groups overlap, some of the non-social instincts being called out by human beings, for instance, fighting. Both groups work together in building up a social community.

Distinguish the non-social from the social instincts.

The social instincts to be discussed are: (1) Motherly behavior and the allied tendencies of kindliness and sympathy; (2) gregariousness; (3) desire for approval, and display; (4) rivalry; (5) imitation; (6) sex behavior.

MOTHERLY BEHAVIOR. — Among the crude, violent, often selfish natural tendencies, the maternal instinct with its accompanying kindliness and sympathy stands out in strong relief. This group is one of the roots of humaneness; it is the source of altruism, and of the consciousness of the brotherhood of man. Only in connection with the motherly instinct is the tender emotion found, that desire to shelter that makes for the warmth and intimacy of home relations. The maternal instinct is found in both men and women, though in greater strength in the latter, while the responses are different in the two sexes. To babies, women tend to respond by cuddling, handling, kissing, cooing, etc., and to babies in pain or discomfort, there is an added response of active measures for their relief. Men tend to respond to

babies less by tendencies to clasp and fondle; but tendencies to watch and be interested in their play, to feed and protect them are present. Of course, this general tendency to be interested in babies becomes narrowed and fixed by the possession of a baby. The maternal instinct then becomes modified by the instinct of ownership, and the resulting combination is one of the strongest motives in life. Parents' love for their children may become a governing passion, overshadowing everything else. Nothing is too great to give or to bear for the sake of their children. The lives of daily self-sacrifice and denial, of longing and suffering, offered up for the sake of their children, none but parents can know. And such lives must be, in most cases, their own reward, for there seems to be no filial instinct which, in return, makes children mindful of their parents. The doll-play of very young children, boys and girls alike, is in some aspects an early, gradual appearance of this instinct, though we have no evidence to show that the more inveterate doll-player makes the better parent later on. But many other tendencies are involved in doll-play, such as manipulation, fetishism, desire for companionship, dramatic representation, habitation, collecting, even bullying. The more obvious, external analogies to parental care should not mislead us into thinking it a true growth of motherly behavior instinct proper.

Kindliness. — Kindliness and sympathy are more diffuse, less definite tendencies. Their source seems to be, first, the tendency to pay attention to any other human being, and to relieve hunger or pain; and second, to be satisfied with happy and contented behavior in others, and to enjoy it. Good-will to men has its roots in the original nature of man. The parental instinct alone often becomes narrow and selfish; these two allied tendencies make for general comfort and happiness. It is an instinct in the human race to make others happy, and to be happier because of their happiness. In this man transcends the animals. They show the tendency

to motherly behavior, often suffering death in the protection of their young; but in man we find these tendencies which lead to general community well-being very highly developed. In these we find the source of disinterested service and beneficence, and they are involved, too, in the growth and development of morals. It must be remembered, however, that these social instincts grow amidst a welter of individualistic tendencies, and among other social tendencies largely selfish in their ends. It is therefore a very easy matter for them to be overlaid, choked out, or perverted to special and narrow lines. It remains a fact, in spite of the tendency to bully, that the human race instinctively shrinks from the sight of suffering for any of its members, and revels in their happiness and comfort. To retain these tendencies and yet adjust them to the more selfish instincts, to develop them along the lines of practical service and prevent their waste in mere effervescent sentimentality, to extend their field from the physical to the realm of the mental and spiritual is one of the most important duties of the educator.

Sympathy. — Sympathy in its first crude form is the result of reflex imitation.[1] The baby laughs and cries, looks serious or is happy, is irritable or good tempered, according to the frame of mind of the adult. Thus at the beginning of life the mental attitudes of other people affect the child and make a difference in his own feelings. This form can hardly be called sympathy in the usual sense of the word, but along with the tendency towards kindliness it is the source of the real, conscious sympathy which comes later. Somewhere between one and four, most children show another response, also a pseudo-sympathy. They cry because the doll, the engine, or the flower is "hurt." This has been called animistic sympathy. Its presence is probably due to two reasons. In the first place, the child as a self-conscious being is not

Trace the stages of development of sympathy.

[1] See pages 70 to 74 for fuller discussion of imitation.

fully developed, he has not yet distinguished between the parts of his own body, and the " I " which inhabits that body. His clothes and his toys, everything he loves, he makes part of himself, and therefore responds to the ills of these material objects as if they were his own. This at the beginning is not conscious personification, but lack of differentiation. The second reason is the example of parents and nurses in such remarks as, — " Don't kick the chair, it hurts." " Poor dolly bumped her head on the floor," etc. Children quickly pick up this way of talking, and it encourages this second type of sympathy. The sentimental type of nature study which gives flowers and seeds, the wind and the rain, feelings like those of the child, works toward the same end. This sort of thing is not bad, only on general principles it seems very unfortunate to do anything which encourages in the child false ideas, unless they must of necessity be the only way of reaching the end, and that end is worth while.

True sympathy involves the ability to be sensitive to the situation, to understand it, to put one's self in the place of the sufferer, and then do what may be done to relieve. The same holds true when the sympathy is with joy. Without experience one lacks sensitivity and ability to analyze; without imagination it is impossible to see one's self as the other — to enter into the suffering or the joy and fully sympathize. But even these two factors are not enough: one may have the experience, possess imagination, but lack the interest in people which is the necessary motive power in sympathy. Children in their cruelty to animals lack sympathy largely because other instincts are for the time being stronger, or because their imagination never makes them take the place of the animals. They lack sympathy with the joys and sorrows of adults, and of those much more fortunate or unfortunate than they because of lack of experience. Adults often are lacking in sympathy because of narrowness and selfishness; they are not interested enough in people to care

what happens to them, — the instinct of kindliness has been choked. This statement is especially true when there are no signs of violent physical suffering. To keep alive the instinct of kindliness and to develop true sympathy from the crude roots are important for social progress and well-being. This means giving children breadth of experience, both real and vicarious, developing their imaginations and developing interest in people by giving them opportunities to do things for real people in real situations.

GREGARIOUSNESS. — In common with many of the lower animals, man has the gregarious instinct. He is by nature social, responding to the presence of human beings with satisfaction and comfort, and to their absence by restlessness and discomfort. Solitude is one of the conditions he fears, and being a member of a crowd is in itself a pleasure. This desire for the presence of others shows itself in babies. Being left alone in the room will often call from the baby a cry of distress, and the adult human being seems to afford the greatest comfort to him. After babyhood, the instinct shows itself more particularly in desire for companions of the same age, although at adolescence there may be a desire for association with those older. It is also true that an adult, if left alone in a house, finds comfort in the presence of a child.

In what forms does gregariousness show itself?

Value, for development. — In savage communities, this instinct was necessary for the procuring of food and for protection, and from it have grown the social and community life which make for civilization and progress. It is noticeable that in general to-day, community of interests is the tie that binds groups together. It binds people together in the same section; it causes people of one nationality to congregate in one section of a city or state. With this tendency as the foundation, together with the food-getting, hunting, and fighting instincts, it is easy to see how coöperation developed; but without the gregarious instincts bringing individuals

together, making their presence a satisfaction and their absence a discomfort, it is probable that the so-called social interests would have been very slow to develop.

McDougall illustrates this by the fact that " On their few short holidays the working classes rush together from town and country alike to those resorts in which they are assured of the presence of a large mass of their fellows." . . . " How much more satisfying is a good play if one sits in a well-filled theater than if half the seats are empty; especially if the house is unanimous and loud in the expression of its feelings." But he also thinks that in our present state of civilization, it is overdeveloped. He says, " The administrative authorities have shown of late years a disposition to encourage in every possible way the gregarious tendency. On the slightest occasion they organize some show which shall draw huge crowds, many thousands of people from their work to spend the day in worse than useless idleness, confirming their already over-developed gregarious instincts. There can be no doubt that the excessive indulgence of this impulse is one of the greatest demoralizing factors of the present time." [1] There can be no doubt of the strength of this instinct. The crowds that walk on " parade " thoroughfares, the congregation of people at seaside resorts and at displays of all kinds, are proofs of its strength. The popularity of strikes, the difficulty farmers have to secure farm-hands, and housewives have to get house workers are all somewhat the result of this tendency.

Importance in child life. — The strength of this instinct and its value in developing the individual through coöperation with others which it encourages make it of great importance that the child should have companions of more or less his own age. The only child, or the lonely child in a family who grows to the age of eight or nine with no playfellows of his own age, loses much that is difficult to make

[1] McDougall, Social Psychology, pp. 96 and 298.

up later. For such a child, attendance at kindergarten and school may be the best possible help. This tendency shows itself in children during the pre-adolescent years, especially in the so-called " gang " instinct so prominent during the years ten to fifteen. The spread of this tendency is hardly recognized by adults. Sheldon[1] found 934 different societies or clubs among 1139 boys, and 911 societies to which 1145 girls belonged. Puffer[2] says " it is safe to say that three out of every four boys belong to a gang "; only 21 per cent of the 13-year-old boys interrogated had never belonged to a gang, and 26 per cent of the 12-year-old boys. This instinct has bound up with it the desire for physical activity, the love of adventure, and the interest of getting results which count.

Swift in his book entitled " Youth and the Race " points out how the school, especially at this period, occupied as it is with fact-getting and drill, ignores, frustrates, and antagonizes these innate tendencies at every turn. He says, " The school is composed of two opposing forces: the one, the teacher, trying to win attention by creating factitious interests, and the other, the children, momentarily attracted by these devices but always watchful of a chance to assert their social selves. . . . We have seen that the same subjects of study are tedious under the ordinary class method and interesting when made the order of business in a club of the members of the class of which the teacher is an integral but inconspicuous part. The club idea appeals to the racial instincts of love of glory — showing off and personal competition, both of which are elements in the group sentiment." [3] It is certainly true that this tendency contains much of value, and it is the business of the school at this time, as at all others, to make use of the energy the child has and to mold and direct the tendencies which are hereditary.

The attempts at ignoring or suppressing this instinct are

[1] Am. J. Psych., Vol. 9, p. 249. [2] Ped. Sem., Vol. 12, p. 176.
[3] Youth and the Race, p. 285.

the cause of much of the problems of discipline in the schools and of the juvenile delinquency which troubles the courts of the big cities. The fact that the schools, many of them, are so organized that this instinct is not given opportunity to work itself out in connection with the school work is the cause of much of the dissatisfaction with school in boys of eleven and twelve, as well as the cause of much of the dropping out from the sixth and seventh grades. However, recent broadening of the school duties and functions is in line with a fuller provision for the gregarious instinct in its various forms. The school playgrounds, school government, the more extended use of the school plant for clubs and societies and classes of all kinds, as well as the changes in classroom method, — all these movements help towards a fuller recognition of the child nature in the pre-adolescent years.

DESIRE FOR APPROVAL, AND DISPLAY. — Man's attitude towards approval and scorn is part of his original equipment. By nature he is satisfied and made happy by approving looks, smiles, hand-touches of those about him felt to be equal or superior, or the admiring glances of inferiors, and he is made uncomfortable by scowls, frowns, derisive looks and jeers. Love, respect, or admiration for those administering the approval or the disapproval of course intensifies its effect.

Differences with maturity. — In connection with this innate desire for approval, the human being has also the tendency towards display. To " show off " is instinctive; every one has the tendency to do it in the presence of those from whom he wishes to win approval. From the " see me " of the baby, through the strut or other special gait of the adolescent to the adult who " puts the best foot first," the tendency is the natural one of winning approving responses by means of display. The power shown and the persons from whom approval is demanded or scorn avoided change as the

How do the responses of the display instinct change with age?

child grows older and experience modifies his first crude reactions. At first, the display is of new things learned, new words, new tricks, or new manners; in childhood it is often physical skill or powers. It is at this latter stage that competition plays such a large part in connection with the display of various feats. In adolescence the display may include intellectual and moral qualities; it is in connection with these also that the adult tries to win approval. The persons from whom the approval is most desired are at first the adults of the immediate family, usually the mother; as the child enters the school world the opinion of the teacher becomes of first importance; with the prominence of the "gang" spirit in pre-adolescent and adolescent years, the opinion of companions of the chosen group becomes the most compelling influence in the child's life. If there is hero-worship at this time, of course the approval of the hero often becomes more valuable to the boy or girl than even what the others think. The adult seeks the approval of friends and acquaintances and society at large.

The power of the prevailing customs or traditions to hold men and women to certain lines of conduct is due largely to their fear of public scorn and love of public approval. Why do men wear stiff collars when soft ones would often be more comfortable? Why do women buy a new hat fall and spring, or at least have the old one made over, when it is perfectly good and more becoming than the new one? "The institution of tipping, which began perhaps in kindliness and was fostered by economic self interest, is now well-nigh impregnable because no man is brave enough to withstand the scorn of a line of lackeys whom he heartily despises, or of a few onlookers whom he will never see again."[1] It is true that "The strength of the regard men pay to public opinion, the strength of their desire to secure the approval and avoid the disapproval of their fellowmen, goes beyond all rational

[1] Thorndike, *op. cit.*, p. 90.

grounds"; but as has been shown it is a natural tendency of great power, and it needs direction rather than suppression, for in it are elements that lead to the higher development of the individual and society, elements of value and of strength. McDougall says concerning it, "For the praise and blame of our fellows, especially as expressed by the voice of public opinion, are the principal and most effective sanctions of moral conduct for the great mass of men; without them few of us would rise above the level of mere law-abidingness, the mere avoidance of acts on which legal punishment surely follows; and the strong regard for social approval and disapproval constitutes an essential stage of the progress to the higher plane of morality, the plane of obligation to an ideal of conduct."[1] It is the business of the school to see that this progression takes place, and it cannot come through the ignoring of the root motive. Appeal to love of approval is perfectly legitimate, provided both the kind of appeal and the kind of approval desired are progressive. The personal approval of the teacher for good work is a legitimate appeal for children of primary school age, but that same appeal made to high-school students is not, for they are capable of response to a higher type. It is only by means of progressive appeals that the child learns to distinguish between conduct due to the force of public opinion, and that which is an obligation to an ideal of conduct.

RIVALRY. — Rivalry or emulation as an instinct is usually taken for granted, but it has been left in general, vague terms. Both McDougall and Thorndike have recently pointed out that it is not such an all-inclusive tendency as has been supposed. It is probable that as a matter of original nature, apart from learning, the impulse of rivalry shows itself only in connection with activities which are in themselves instinctive. Man, hunting or collecting or reaching out for

What are the values of the rivalry instinct?

[1] *Op. cit.*, pp. 188, 189.

things or trying to win approval, works more energetically when fellow creatures are doing the same things, and feels keener satisfaction at success or keener disappointment at failure than when he works alone. Though this is the crude foundation upon which experience builds all the later habits of rivalry, it still remains true, however, that it is much easier to appeal to the interest in surpassing others in such things as sports and games, than in situations when the quality concerned is moral or intellectual. To use the instinct of rivalry in the gymnasium to get a boy to lengthen his jump is easy, but to use it in making a boy more studious or more truthful is very much more difficult.

Dynamic value. — The strength of the crude instinct is shown by the power it has gained in its modified forms in all departments of life. It is competition which speeds up the wheels in the business world. It is said of Bismarck that "There was nothing a rival could say or do but Bismarck if he chose, would say or do something which made it appear a failure." The attitude which controls men to-day everywhere in the endeavor to outdo the next man in business, to make appearance, to have a better house, even to have children surpassing his — this motive is the controlling one in the lives of the majority of men and women. It appears in art and literature. Even the churches are not free from it; to send more money to missions, to have a larger congregation, to have more people join the church during a year is a positive satisfaction.

Danger of overdevelopment. — The dangers from such an attitude can be readily seen; it is working in opposition to kindliness and sympathy, and is often antagonistic to coöperation. Yet the instinct of rivalry is a force of tremendous power, — a force necessary in such a complex civilization as ours to make for the best development, to weed out the useless and crown individual effort and ability with success. This end

With what other tendencies does rivalry conflict?

is the ideal, and it cannot be attained unless educators frankly recognize this part of the child's original equipment, realizing its value while facing at the same time the dangers of its misuse. To train a child so that the motive of rivalry will work in the higher fields of intellect and character instead of only in the field of the physical and material, is well worth while. So to train him that individual competition becomes group competition is to train for unselfishness. When the group concerned is not merely his "gang," but a larger group composed not only of friends but also of strangers, all of whom are working for a common end against another similarly constituted group, much has been done towards developing a social consciousness. But the child must be met at the level of his development. To overemphasize group work and group competition in the kindergarten and early primary grades when individual competition is so strong is contrary to the nature of the child. On the other hand, to give little or no group work in the upper primary and grammar grades at a time when the gang spirit is developing, and therefore when group competition could easily be appealed to, is wasteful. The process must be progression, from individual to group, from lower levels to higher; but the start must be made with the crude form and not at some stage far in advance. This tendency, like all the others discussed, is in the child to be used and modified, not just to be accepted, nor to be ignored.

IMITATION AS AN INSTINCT. — To include imitation as an important instance in all lists of instincts has been customary. Imitation has been defined as the tendency by one individual to copy the actions or movements of other individuals. James says:[1] "This sort of imitativeness is possessed by man in common with other gregarious animals and is an instinct in the fullest sense of the term." Kirkpatrick defines it "as the tendency to repeat what has been perceived, especially

[1] Psychology, Vol. 2, p. 408.

the sounds and movements made by others of the same species." "Everything, from the crowing of chickens to the whistle of a locomotive, from the wriggling of a snake to the preaching of a sermon, is imitated. Nothing in his environment, physical or social, escapes the child." [1] This is the historic view of imitation, but some more recent writers have questioned the existence in the instinctive form of such a wholesale tendency to reproduce in one's self one's environment. Cooley writes, "The 'imitative instinct' is sometimes spoken of as if it were a mysterious something that enabled the child to perform involuntarily and without preparation acts that are quite new to him. . . . This doing of new things without definite preparation, either in heredity or experience, would seem to involve something like special creation in the mental and nervous organism; and the imitation of children has no such character. It is quite evidently an acquired power, and if the act imitated is at all complex the learning process involves a good deal of thought and will." [2] Thorndike in discussing the same subject says, "On the whole, the imitative tendencies which pervade human life and which are among the most powerful forces with and against which education and social reform work, are, for the most part, not original tendencies to respond to behavior seen by duplicating it in the same mechanical way that one responds to light by contracting the pupil, but must be explained as the results of the arousal, by the behavior of other men, of either special instinctive responses or ideas and impulses which have formed, in the course of experience, connections with that sort of behavior." [3] McDougall, too, denies the existence of a general instinct of imitation.

It is specialized. — That there is an instinct of imitation is not being questioned by any of the writers quoted, but their

[1] Fundamentals of Child Study, pp. 58 and 131.
[2] Human Nature and the Social Order, p. 26.
[3] The Original Nature of Man, p. 122.

contention is that it is very much less general, very much more highly specialized than was commonly believed. The trend of opinion at present is to deny an instinctive basis to any of the forms of imitation, save the form known as "reflex" imitation. Man laughs, cries, runs, looks, frowns, snatches, crouches, and hunts when others do because of an instinctive tendency. This is the crude root from which the other forms spring. That other forms, *i.e.* "spontaneous" and "voluntary," exist is no doubt true but they are habits, learned and built up just as any other habits are learned.

Most imitation is due to habit. — The chief reasons for denying a general instinct of imitation are three: First, it is difficult to see how the nervous system could be arranged in order to provide such an instinct; second, the higher animals, even the monkeys, prove to be lacking in any such general tendency; third, the close observers of children fail to find evidence of a general tendency to imitate.

What are some advantages of imitation?

If this point of view is correct and imitation is largely habit, then the educator has a much greater control over it, for it must be governed by the same laws which control learning in general, the laws of exercise and effect. The child imitates his fellows in all sorts of ways because satisfaction has been derived from such action, not because he cannot help it. For the same reason the youth apes his elders and one nation imitates another. The force of these habits has already been pointed out. "Imitation is the prime condition of all collective mental life." Custom and tradition in all fields are but an expression of its power. Because it has been found that the imitation of the thing in vogue, no matter what it may be, brings public approval, and the violation of the prevailing custom brings scorn and criticism, man does and thinks as others of his group do and think. This tendency may be seen in politics, education, and religion, as well as in the trivial matters of dress. Young men vote as their fathers do, and

show the attitude towards religious matters which is that of their family and their community. The dangers of such habits are evident; mechanically used, they make for stagnation instead of progress, for dependence and blind following instead of independence and originality. Some communities and even nations are examples of imitation "run to seed."

Value of imitation. — Despite these very grave dangers, the fact of imitation is of inestimable value to the human race, and the crude root instinct is one of humanity's most valuable assets. It is the great conservative power by means of which the culture, inventions, ideals of each generation are passed on to the next. By means of habits of imitation the child can very much abridge the tiresome method of learning by trial and error, and can learn what his father knows in very much shorter time. It is also a great power for progress, both for the nation and the individual; for the former in that by this means the ideas and ideals of especially gifted minds come to be adopted by large numbers of people; for the latter, in that it permits him to gain a large variety of experience, and therefore to grow in originality. It is the means by which "the child is led on from the life of mere animal impulse to the life of self-control, deliberation and true volition. And it has played a similar part in the development of the human race and of society."

As a method of learning then, it is to be encouraged in all fields, — in art, in literature, in industry, in teaching, in morals, in character, imitation is well worth while. Few, very few, will go to the second stage, that of constructive leadership, fewer still will think things out for themselves; the vast majority in all departments of life will be the followers. Well for them if in their lives they conserve the best that both the past ages and the present have to offer. For all, imitation must not be merely a means of gaining public approval by the slavish following of the present mode, but should involve conscious choice of models, should in-

volve analysis of the method of gaining results comparable with the model in order that attainment may more nearly measure up with ideals. This use of imitation involves judgment and choice, constructive imagination and independent work. With a background of experience of imitating various models, say in music or in literature, the individual may then fairly be called upon to give his own interpretation, and to produce something original. Thus in rhythmic order, imitation is succeeded by invention, and that in turn by new and fuller imitations, and thus the scale ascends. It follows, therefore, that the work of the educator in connection with imitation is: to build on to reflex imitation habits of imitation of all kinds; to develop judgment and analysis in connection with choice of models and methods; to require a balancing of results in comparison with the model; to provide many and varied models to encourage invention, independence, originality as a result of varied imitations.

SEX INSTINCT. — That the sex instinct, the instinct which leads to the reproduction of the race, is one of the strongest, if not *the* strongest that man possesses, needs no emphasis. The structure of society voices its strength, while literature, art, and music are evidences of its beauty. This instinct should not be confused with the instinct of motherly behavior; the two are distinct, although they are probably related, and they exist in different degrees of development in the same individual.

Stages and fields of development. — Real knowledge concerning the course of development of the sex instinct is only now being obtained, and there is much disagreement concerning most of the important points. This fact is due to the cloak of silence and insinuation of shame that tradition has thrown about everything connected with sex, and to the difficulty of observing the stages of its development in children. The common viewpoint has been that the child "matured"

Distinguish between the physical and the psychical side of the sex instinct.

at adolescence, that this maturing was accompanied by certain physical signs which are the conditions of the presence of the sex instinct. According to Moll, this opinion contains two errors. In the first place "maturing" occurs on the average much sooner than the so-called adolescent age, and in the second place, the presence of the sex impulse is not dependent on these physical signs. The evidence shows that the sex instinct begins its development before eight years of age, and continues to grow in strength, though not continuously, up to maturity. Processes occurring in two distinctly different fields combine to make up the sex impulse proper. The first set of processes go on in the physical realm wholly, and consist of the various sensations, nerve disturbances, reflexes, secretions, and the like, which together are called the phenomena of detumescence. The second set are in the psychic realm, and include the various attractions, fallings in love and kindred emotions, also the sentiments of disgust, shame, and modesty, which together make up the phenomena of contrectation. In the normal adult these two sets of impulses are coördinated and synchronized; but during the long development of childhood and early adolescence either set may occur independently of the other.

Normal and abnormal development. — In the first, or neutral, period of earliest childhood practically no contrectation impulses are felt; and such detumescence processes as are present are felt but vaguely with little sex consciousness or localized sensations except in pathological cases. This period is followed by the undifferentiated stage, beginning usually about the eighth year of life, sometimes as early as the fifth, occasionally not till the tenth and lasting till the age of fifteen or so, in some cases up to even twenty years old. During this period the contrectation impulses frequently become very marked; children form strong attachments for other children or for adults of either sex, some-

What stages of development does this instinct show?

times even for animals, but there may be quite a succession of these objects of affection. These impulses are expressed by taking every chance to see, be with, touch, kiss, or embrace the person who is for the time being the one beloved, or even, in a sort of fetishism, any article belonging to, or touched by that one. Romantic dreams, blind jealousy mingled with passionate devotion often produce most erratic conduct, from slavish imitation to outbursts of wild display. Cases of "calf-love" and "crushes" are illustrations of these complexes. All this does not mean to imply that every case of enthusiastic friendship is a manifestation of the sex instinct, either in this period or the succeeding one; but that, very frequently, the incompletely developed instinct does show itself for a while in this form. In the genuine, sex-dominated loves, however, there may be lacking every simultaneous, localized sex-feeling proper, especially any conscious connection for the child with physical changes and processes; though sometimes the keen desire for close proximity leads to undesirable practices, not to say real risks. As a matter of fact, the coincidence in adolescence of a rush of affection and of an involuntary orgasm may come as a complete surprise to the individual experiencing it.

During the undifferentiated stage, as the body gradually matures and the secondary sexual characteristics appear, there may be exhibited, quite independent of the psychic symptoms, various tendencies which need careful watching lest they harden into habits and develop into perversions later on. Among these may be mentioned exhibitionism, masturbation, skatophilia, mutual malpractice with either sex including masochistic and sadistic acts. The instincts of curiosity, love of novel experiences and of sensations for their own sake, combined with manipulation are quite sufficient to account for the easy start of bad habits, especially if a feeling of shame and a tendency to secretiveness are fostered by an unwise atmosphere of concealment and suppression

on the part of the adults. Later, in the fully developed stage, the contrectation impulses center themselves normally about a member of the opposite sex of near age, the body so matures that the complete sexual act is possible, and, as stated before, the two sets of impulses are felt in connection with each other. There is great individual variation in the time of the beginning of these stages just as there is in the time of the onset of puberty; but, as in the latter, girls are apt to be a year or two ahead of boys of the same age.

Sex education. — Failure to progress from the undifferentiated stage may involve abnormal psychic tendencies in adult life such as fetishism, sexual anæsthesia, homosexuality, and the like even though in mild forms. It is necessary, therefore, to recognize the significance of the period of childhood for the training of healthy-minded, really moral adults. We must not make the mistake of supposing we can ignore this instinct, so vital to the social welfare, in the years before the obvious signs of maturity are present. From the standpoint of child psychology, the chief questions of importance are: (1) What means should be taken to keep the development normal? (2) What knowledge should be given the child, when, and by whom? (3) What is the duty of teachers towards the child so far as this instinct is concerned?

Why are the years 8 to 12 important for sex education?

Training. — In answering the first question, — on the physical side undue activity of the instinct is prevented by encouraging much physical outdoor exercise, by not allowing the child to sleep with another, nor to be too warmly covered in bed, nor to stay long in bed after he is awake; by seeing to it that the genitals are kept absolutely clean, and that the clothing is not tight, by not allowing the handling of the parts by the child nor by any one else; by being on the watch to eliminate corporal punishment, bicycle or horseback riding, gymnastic exercise such as vaulting or pole climbing if any sex excitement results. On the mental side,

care must be taken that the attitude toward all sex matters is not that of shame, nor of mystery, nor that of frivolity, nor vulgar familiarity, but one of wholesome, dignified frankness; that the child forms no impure associations with such matters, due to bad companions or books or pictures; that ideals of purity, of reverence for parents, of the sacredness and use of the sex function be built up from the beginning.

Instruction. — As to the second question, "What knowledge should be given the child, when, and by whom?" there is much difference of opinion. Moll says, "The sexual enlightenment of the child is advisable. The biological processes of sex in the vegetable and lower animal world may be taught in school as early as the second period of childhood" (between the ages of seven and fourteen). "A warning against the dangers of venereal infection may be given at school to the senior pupils shortly before they leave, or at some similar suitable opportunity. But for effecting enlightenment regarding the processes of the individual sexual life, the school is unsuitable; this matter can best be undertaken by some private person, and above all by the mother. Choice of the time for the last phase of the sexual enlightenment must be guided, in part by the questions of the child, in part by the child's physical maturity, but more especially by the indications of psychosexual development."[1] In this connection it must be remembered that the question does not involve a choice of giving or withholding certain information; children get it anyway. The question is rather, shall it come from a reliable source in a way to establish confidence and sympathy, with sacred and beautiful associations, or shall it come from companions on the street, perverted, untrue, and with coarse and brutal associations? It seems safe to answer children's questions frankly and truthfully so far as their age will permit understanding. It should also be borne in mind that the instruction should be positive and constructive, dealing

[1] The Sexual Life of the Child, p. 298.

with the normal and leading to high ideals and principles, not negative with the emphasis on perversion, and the need of avoiding disease. Bigelow instances five types of people who are not qualified as teachers along these lines: (1) those who cannot talk calmly and dispassionately on the topic; (2) those with abnormal outlook on life, who are too readily influenced by psychopathic literature; (3) insufficiently informed people, who tend to stress the abnormal in their presentation because of hasty preparation; (4) people who are pessimistic as a result of unfortunate personal experiences; (5) those of flippant attitude and questionable ethical behavior who cannot command the respect of their pupils. School teachers of nature study, biology, literature, and civics have opportunities not only of giving knowledge but of creating the right attitude to the facts. Playground directors, the gymnasium teacher, the school nurse, the physician may all add to the knowledge along different lines and watch over the formation of good habits. Club leaders, pastors, social directors find still another avenue of approach and field for training. Above all, the home is the first and most natural environment in which sex knowledge may be given if the parents are really awake to their responsibility.

The teacher's duty. — "What is the teacher's duty in all this?" Just the same as it has been in connection with the other instincts, to prevent its overdevelopment, to adjust it to other instincts, to direct it into the highest possible channels. This means that a teacher should know the facts regarding sex development, should know the precautions to be taken to prevent undue excitement, and should know the signs of abnormality so that medical advice could be given to a child when needed. She should be ready to give necessary information to the child if the parents will not, or cannot; and she should realize, especially if her work is with an ignorant class of people, that it is part of her duty in con-

nection with mothers' and fathers' meetings often to give them facts in this line and always to raise their ideals, and make them realize their responsibility.

Some dangers exist in connection with instruction along this line, both for adults and children, especially to-day when the topic is being discussed so freely. One has been indicated above, in that the wrong sort of people may offer to teach it. Another is that the very strength of the instinct makes the individual oversusceptible to suggestion, and harm may come from curiosity leading to experimentation. Another is that the interest excited in it may be out of proportion, and become morbid. Dwelling on this topic results in its being given undue prominence, and the individual very quickly sees everything in relation to it. This is unfortunate, as exaggeration always is; but it is especially so in this field where the fund of emotion is so tremendous, and the dangers so grave. "The sphere of the sexual must be regarded as a fraction merely of the general educational field. The inculcation of true ideals of morality, and of a sense of honor not confined to externals but one by which the entire being is permeated, — these will be the safest essential of a good sexual and general education."

Exercises

1. Spend two half hours, at different times, in intensive observation of one child four to six years of age, recording all that he does in that period. Analyze this behavior into expressions of the various instincts treated in this and the preceding chapter. Note particularly the situations arousing responses of fighting, hoarding, teasing, kindliness, display.

2. Ask 20 adult acquaintances from whom they acquired their first information, and at what age, about (*a*) "where the baby came from," (*b*) reproductive functions in their own body, (*c*) the relationship of the sexes. What conclusions do you draw as to sources of information and the resulting attitude of the child?

Questions for Discussion

1. What means may be taken to develop kindliness and sympathy in children?

2. How are sympathy and the feeling-of-self related genetically?

3. Show how desire for approval may be utilized to motivate school work in the third grade, in the eighth grade. To influence moral conduct in the kindergarten, the fifth grade, the high school.

4. In what way should the gang instinct be controlled and directed? What is the danger of ignoring it?

5. Suggest methods of training that will change personal rivalry into group rivalry.

6. Point out some disadvantages in fashions, customs, precedents, moral tone, etc., that come from imitation. How may the force be made an advantage in these matters?

7. What is the difference between sex instruction and sex education in (*a*) aim, (*b*) method, (*c*) subject matter?

8. Give some reasons for information, or training, or both, with regard to sex in the first five years of life, the next nine or ten years, the later teens. How can social and religious organizations help in this matter?

9. Discuss the conclusions reached as a result of Exercise 2 above.

References for Reading

McDougall, *Social Psychology*, pp. 168–173, 329–345, ch. XII.
Moll, *The Sexual Life of the Child*, pp. 33–113.
Bigelow, *Sex Education*, chs. 4, 6, 7, 8, 9.
Thorndike, *Original Nature of Man*, chs. 6, 7, 8.
Puffer, *Boys' Gangs, Ped. Sem.*, Vol. 12.

CHAPTER V

TENDENCIES ACCOMPANIED BY AFFECTIVE STATES

PHYSIOLOGICAL BASIS FOR SATISFYINGNESS. — Man is continually "wanting" something. All people are unremittingly doing the same thing, striving to satisfy their wants and desires, to obtain food, friends, reputation, public approval, to outdo others, to show kindliness, to collect, to gain results mental and manual, to rest, — or, on the other hand, to avoid deprivation of any of these things, to avoid scorn or rebuff, pain or failure. We spend our lives striving after certain situations, certain responses, and dodging other situations, other responses. So far in the description of original nature, there has been nothing which could explain this attitude. Why should man spend his life for certain things, and pay no attention to others, or avoid them? The instincts already discussed give no explanation; they show man to be equipped by nature to respond in certain ways to certain situations when those situations are present; but in themselves, they offer no reason for man's taking any definite attitude towards them. Were the account so far given of the major instincts a complete one, man would supposedly take things in natural sequence, and react on the situation in neutral fashion and that would be all. This is not quite true; for in the description of the Social Instinct it has been impossible to avoid bringing in this other factor of attitude towards the situation. There must be something in the original equipment of man to account for these differences in atti-

Are some situations originally satisfying, and annoying?

tude, some situations must, because of structure, be satisfying to human nature, and others annoying.

To describe what is meant by " satisfying " and " annoying " is difficult. Pleasure and pain with their usual connotations are not synonymous terms. Their best description seems to be that " By a satisfying state of affairs is meant roughly one which the animal does nothing to avoid, often doing such things as attain and preserve it. By an annoying state of affairs is meant roughly one which the animal avoids or changes." [1] Original nature, then, not only provides all sorts of responses, but provides also that the animal shall " feel " in definite ways towards them, shall like some, and dislike others. From these feelings of " satisfaction " and " dissatisfaction " arise all later desires, wishes, and motives. They are the elements of the life of affection, the roots of feeling.

Various theories. — Just when a situation has this satisfying quality, just when a situation is annoying, has occupied the attention of psychologists for some time, and as yet there is no answer which receives general acceptation. The most popular theory, probably, is that espoused by Stout and Dewey, and slightly modified by Thorndike. The former maintain in somewhat different forms that the accompaniment of any smooth-running, uninterrupted activity is satisfying, and that any thwarting or interruption of an activity is annoying. Thorndike says, " when any original behavior-series is started and operates successfully, its activities are satisfying, and the situations which they produce are satisfying," and vice versa, " when any original behavior-series is started, any failure of it to operate successfully is annoying." [1] Besides these " behavior " satisfiers and annoyers, there are some constant independent annoyers and satisfiers that need to be considered. Physical pain, bitter tastes, bad smells, slimy things, depression, solitude, disapproval, and intense

[1] Original Nature of Man, pp. 123, 124.

sensory stimuli are almost always annoying, no matter what behavior-series is involved. " Sweet, meaty, fruity and nutty tastes, glitter, color and motion in objects seen, being rocked, swung and carried (in childhood), rhythm in percepts and movements, elation, the presence of other human beings, their manifestation of satisfaction and their instinctive approving behavior " [1] are independent satisfiers.

The explanation of just what is the neurone condition which permits of this feeling of satisfaction or annoyance is also being questioned. One theory is that since instincts are tendencies to act involving the presence of a chain of neurones with synapses in functional contact, when such a series-with-synapses-ready-to-act is actually called upon to conduct, the mental accompaniment of the readiness is satisfaction; further, when such a series-ready-to-act is prevented from conducting, the mental accompaniment of the hindrance or checking is annoyance; or, when a series-unready-to-act is forced to conduct, the result is likewise annoyance. Compare by analogy the lack of friction when a line of people is prepared to pass water-buckets at a fire and is started doing so, and the friction occurring when either, being prepared, no buckets come their way, or when unprepared, buckets are started down the line. Now some neurone connections are always ready, others always unready; therefore we have independent, invariable, perennial annoyers and satisfiers. It must be borne in mind, as was pointed out in a previous chapter, that " readiness " depends on inner growth and maturity, as well as upon conditions of nutrition, disease, fatigue, and familiarity.

It is true, then, that merely as a matter of structure, certain situations are intrinsically satisfying to the human race, and others annoying. To have food, to hoard, to beat some one else in certain activities, to fight, to show kindliness, to tease, to display one's powers, to win approval, to be physically and mentally active, — these responses are to be desired

[1] Original Nature of Man, p. 130.

and sought, they are in themselves satisfying emotionally. The reverse of them, *e.g.* having to sit when the tendency to physical activity is ready, being told not to ask questions, being given no opportunity for mental activity, these situations are annoying. To fight when physically tired, or to collect when that occupation has continued all day, may be annoying owing to the depletion of the nerve centers. Each of the instincts as it works itself out produces in the animal a feeling of satisfaction. In these instinctive tendencies, because of this accompaniment of feeling, is found the original basis for all interests, motives, desires, and wants, — those things which control the life, activities, and education of the human race. In order to attain and preserve satisfying states and to avoid annoying states, man is stimulated to learn. Herein is the continual incentive for the learning process. All motives and interests are thus seen to have their origin in some instinct and to accompany its exercise, except in a very few cases where certain sensory stimuli are in themselves satisfying. As the instincts at the beginning are crude and often brutal, so are the interests. The strength of a given interest is the strength of the instinct the operation of which produces satisfaction. As the instincts vary in strength, are delayed or transitory, so are the interests, and so must motives of appeal change. The satisfyingness of mere physical activity to the six-year-old is very great, and the annoyance at being deprived of it is proportionately great; the strength of the hunting or gang spirit in boys of ten or eleven makes the operation of these tendencies satisfying; later, when these tendencies have lost some of their original strength or have become merged in others, the interest in the corresponding situation is much less.

UTILIZATION OF AFFECTIVE STATES IN EDUCATION. — All this is of great importance in education, for it is by use of these original interests that the learning process is started, and it is by grafting the higher, more ideal interests into these crude ones that man's wants are made

better. Gradually to draw a child's interest from personal approval to an interest in gaining approval for his group, and later to the approval of his own conscience; to develop a child's moral sense, so that instead of being merely interested in doing what brings approval he will be satisfied by doing what is right; so to train him that the social interests outweigh the non-social, — this work is the responsibility of the educator, for thus does man pass from the animal level into his human inheritance. The danger in educational practice here is the same as that pointed out in dealing with the instincts; the tendency is to ignore or suppress the fund of energy provided by these original interests, and instead of using these motives to bring out responses, to substitute for them artificial or adult motives. To ask a kindergarten child to do his work because he will need it some day, to appeal to him to be clean and neat because society demands it, to encourage him to tell the truth because it is right, in each case is to make an appeal that means nothing, because of the presence of other instinctive interests, and because of the lack of development of those to which the appeal is made. But to ask him to do his work so that he can use the desired toy, to appeal to him to be clean because then one can love him, to encourage him to tell the truth because it will pay in terms of pleasure right then, — these motives are those that he is working with every day, that have a basis in instincts active at the time. No matter what the words used in appeal are, the work will be done, the child will be clean, and truth will be told, because, and only because of instinctive interests; others cannot be operative because of the child's limitations in development, in experience, in knowledge. Why deceive both ourselves and the child by using more ideal motives? These are in place later, and if kept till the time when the interest is alive in the child they will have force to bring results. Used too early, they are likely to remain empty of true content. The individual is

How are emotions a guide to incentive giving?

self-deceived, acting in response to motives worded in ideal terms, whereas the true motive is a selfish one. The danger in such appeals is not in calling on low and crude ones, but in constantly working on the same level and so failing to provide for the demands of progress and development. Meet the child fearlessly on the level where he is no matter where that may be, and then raise him to higher and higher levels by substitution and pleasurable results.

ÆSTHETIC EMOTIONS. — The original tendencies which are built up into the æsthetic emotions are found in some situations in themselves satisfying. These roots are probably the satisfyingness of glitter and color, or rhythm in percepts and movements. From these crude beginnings comes the enjoyment of nature, of art, of poetry, of dancing, and of music. The fact that the mere presence of certain sensory stimuli causes in the organism feeling-responses of satisfaction makes possible, later, the yielding of one's self to the "perfect moment," when the whole being is absorbed by, and identified with, beauty. The very nature and meagerness of the original equipment leave emotions in the field of the æsthetic extremely plastic. The kind of situation embodying the qualities that call out the satisfaction which is the æsthetic emotion will depend chiefly upon the individual's training and environment.

In what do æsthetic emotions originate?

Just what any individual considers beauty or music or art is a matter of education; and there seems to be nothing else save the qualities mentioned necessary for æsthetic enjoyment, save possibly those which insure unity and ease of attention. The satisfaction aroused in a little child by a chromo or by "ragtime" music is just as truly an æsthetic emotion as that aroused in an educated adult by a Murillo Madonna, or a Beethoven symphony. From the enjoyment of the crude and elemental, the child must be raised to enjoyment of the artistic and complex. Here, as elsewhere, the beginning

must be made on the level where original equipment places the child, not at some level far beyond; for the result of the latter method is to kill true æsthetic enjoyment. Strong, though good, color should be characteristic of the pictures given to children and those that hang on the walls of primary schoolrooms. It should be borne in mind that pictures are used for other purposes than that of æsthetic enjoyment, and therefore this need not hold true of those used for the sake of the story or the association. Gradually, from the appreciation of these pictures, the children may be brought to enjoy delicate harmonies of color, black and white, the qualities of fine perspective. The music, the songs, and the poetry should have decided, simple rhythm at first, other qualities are of secondary importance; later, emphasis may be placed on harmony, on form and assonance. The development must be gradual, however, if true æsthetic appreciation of what is considered the best is to be cultivated.

Joy in creation not identical with æsthetic pleasure. — Be it remembered that the satisfaction or feeling aroused by creation or construction is not at all the same as the æsthetic emotion. The former is satisfaction with activity, love of being a cause, it is dynamic, and comes from the production of results; the latter is contemplative, and more or less passive. That the two emotions are related, and that one may be the condition of the arousal of the other, there can be no question. The production by an individual of a beautiful object is often followed by a contemplation of the beauty which is æsthetic; and the satisfaction in terms of æsthetic appreciation of something beautiful may stimulate the constructive interest. However, the two attitudes are absolutely different, and the training and development of one need not involve the training or development of the other. One may readily enjoy sensory appeals and be trained to appreciation of the beautiful in sound, color, line, or proportion without developing any ability to create in these lines, perhaps with only partial suc-

cess in imitating others' work without offending good taste. Most people can have this passive enjoyment educated, fewer can reproduce acceptably without rigid training in technique, and fewest of all among us so create that the rest can contemplate our productions with real æsthetic pleasure.

Training æsthetic pleasure. — The methods of training appreciation are not well developed; little is done in the schools to direct the æsthetic emotion in the face of the fact that few, very few, of the thousands of children who leave every year can be producers to any extent, whereas all can enjoy, if the power has been developed. The great works of art, literature, music, and nature are ever present, offering the greatest of all opportunities for æsthetic appreciation. However, certain developments in the schools are evidence of the recognition of the power and the value of the æsthetic emotions. The separation of literature from the structural study of English in the high school; the introduction of the victrola, or other planning for the children to hear good instrumental and vocal music and compositions; excursions to art museums, not for criticism, but enjoyment; the excursions into the woods or down to the river, not for nature study, but to develop emotional response; allowing children to read for the sheer pleasure of it rather than for the purpose of reproducing the story, telling the plot, or discussing the style; placing copies of famous statues and pictures in our school corridors and rooms; — all these are endeavors to develop that form of satisfaction which we call æsthetic, whose roots are in the original nature of man.

PRIMITIVE EMOTIONS. — Closely allied to the other type of satisfiers, that is, the action of any behavior-series which is ready, are the primitive emotions. These emotions are also part of the life of feeling, part of the original equipment of man. There is a difference of opinion as to their relation to the instincts. Pillsbury accepts the statement that "emotion is the conscious

Are emotions instinctive?

side of instinct." McDougall accepts the same point of view so far as his seven primary instincts are concerned. He says, "Each of the principal instincts conditions, then, some one kind of emotional excitement whose quality is specific or peculiar to it."[1] Thus each of the primary instincts on its affective side is linked to one definite emotion, *e.g.* the instinct of flight to the emotion of fear, the instinct of pugnacity to the emotion of anger, the parental instinct to the tender emotion. That instinct and the coarser emotions are closely connected, both having their roots in original nature, there can be no doubt; but that there is a one-to-one correspondence between instinct and emotion seems very unlikely. According to this theory, fighting should always be accompanied by anger, and this is surely not true. A small boy may be fighting another, and during the process, experience several emotions, anger, fear, exhilaration, joy of victory, and self-conscious display. It is also true that the mental state called anger has responses of its own, which are not the fighting responses. Just what the situations are which originally call out the various emotions in man is not known. In his study of anger, Hall finds as instinctive causes of that emotion "some thirty physical features, a score of peculiar acts, an equal number of features of dress, a multitude of habits, limitation of the subject's freedom, the thwarting of his expectation or purpose, contradiction, invasion or repression of his self, injuries to pride, injustice, causes of jealousy, and many special circumstances."[2] In Gesell's study of jealousy[3] almost as many situations are given as the original causes of that emotion. Other students believe it to be a much simpler state of affairs. In the various theories and studies of laughter the same complexity and lack of agreement are found. When the opposite end of the behavior-series is studied, and

[1] McDougall, Social Psychology, p. 47.
[2] A. J. P., Vol. 10, quoted by Thorndike, *op. cit.*, p. 76.
[3] A. J. P., Vol. 17, pp. 437–496.

the question is asked, " Just what are the responses that are originally connected with an anger-provoking or a laughter-provoking situation? " the answer is just as indefinite. The same thing is true when one inquires into the kind of mental state that is aroused. The very fact that the emotions in themselves are " subjective " means that they elude analysis and description. Every one knows what an emotion is, since because of general nature every one experiences them; but the cause, the bodily response, and even the states themselves await further study before any definite knowledge concerning them can be arrived at.

General methods of control. — We do know that the child by original nature is equipped in such a way that unlearned responses to situations occur, the accompaniments of which are the emotions. All human beings feel anger, fear, jealousy, sympathy, joy, disgust, and so on, as a matter of inherited connections. The younger the individual, the less experience has affected the individual, the more violent and unchecked will the emotion be. Children's emotions are intense, but they also tend to be more short-lived than the adult's. They need to be controlled but not eliminated; they are a precious asset for motivation, for calling out energy, and as such should be preserved and cultivated. The need is to raise them to intellectual and spiritual levels from the physical and material levels at which they first appear. The desired ends are to develop, for instance, jealousy, so that the child becomes jealous for others as well as for himself; joy, so that he is as happy over the successes of others as over his own; sympathy and kindliness, so that they are aroused by spiritual and intellectual disasters as well as by physical, and by hurt to strangers as well as to friends.

How may emotion be directed?

The laws of learning — exercise and effect — are instrumental in bringing about these changes. Control of emotion is brought about by the same means; but the value of analysis

or the interposition of intellectual states in some way, and of the control of the expressive movements which accompany the emotion should be kept in mind. Thus we may, by the law of effect, learn not to give way to anger by finding that nothing is gained thereby, and a good deal lost. This is a slow process of gaining control, and it may be a very long time before a child discovers for himself, however careful the parents are that that is really true, that he does gain nothing by his fit of temper. Anger may be controlled by redirecting the fermenting spirits so that the energy is worked off in some rather violent exercise. Punching a bag, pitching a ball, chopping wood, " walking it off " are familiar safety valves. Or anger may be held in check by the observation of others who are angry, comparing signs of disturbance in them and in one's self; the contemplative attitude replaces the other, even a feeling of amusement may ensue. Again, analysis of the causes for anger with thoughtful attempt to remedy the conditions that have aroused it will surely disperse it. A quick diversion by a laughter-provoking joke will relieve the condition as well as the proverbial " soft answer." Among the physical expressions, those most readily amenable to control are the quickened breath which may be regulated and the tense muscles which may be forcibly held relaxed (just as in conquering nervousness or an impulse to give way to crying it is important to control the breath and the pitch of the voice, and to stiffen the muscles). With young children, these various distractions must be supplied from the outside. The law of effect was used by the father of a four-year-old who used to throw himself about and kick with rage, when he lifted the child to a rather narrow chimney piece. In anticipation of a fall the child stopped his contortions, although he had previously declared he couldn't. After a few such treatments the boy learned to inhibit those manifestations. To relieve the blood pressure and muscle tension a physician may indorse a counter irritant in the form of flicking the calves.

Being made to run up and down, being sent to bathe face and hands in cold water, even being plunged into cool water, drinking cold water will help some children of from three to six years of age. To be told a story, to hear singing, laughing, and other forms of mental distraction will help others. With older children their conscious coöperation in control must be sought, and the responsibility gradually shifted to them entirely.

Study of fear. *Stimuli and responses.* — Fear is one of the emotions which has been most carefully studied, and although there is still disagreement as to the original causes and responses, and the characteristics of the mental state called fear, still knowledge here is more definite than in regard to any other emotion. Hall's article on Fear, in the Pedagogical Seminary for 1897, is the result of one of the first serious attempts to investigate mental states by means of the questionnaire, and therefore is of historical as well as intrinsic value. Thorndike, after carefully sifting the opinions of various psychologists, thinks that fear is aroused by stimuli such as thunderstorms, reptiles, large animals approaching, certain vermin, darkness, strange persons of unfriendly mien, solitude, and probably loud or sudden noises with certain peculiar qualities. Of course, when two or more of these situations work together, *e.g.* darkness and solitude, the fear is intensified; when some original satisfier is operating simultaneously with any one of them, the fear will be diminished, *e.g.* candy and solitude, or the presence of other human beings when a strange person of unfriendly mien approaches. Of the responses to these situations, thirty-one of the more easily observable are listed by Thorndike.[1] Many of these are antagonistic, such as running away or remaining stock-still, therefore the responses to fear-inspiring situations differ tremendously. It is probable, however, that to the same situation the same individual

What situations and responses constitute fear?

[1] Original Nature of Man, p. 59.

will respond in the same way, but as the situation and the mental states are so different, of course the responses must vary; witness the fear aroused by a thunderstorm and that aroused by a large animal approaching.

Delayed and transitory forms. — Fear, as an original tendency, is subject to the laws of transitoriness and delay. Some psychologists believe that the different types of fear mature at a definite time in the child's development, and then pass. For instance, Kirkpatrick believes that fear of the dark is most intense at three or four years of age, and gradually becomes less, whereas James illustrates the sudden fear of reptiles which appeared in a boy of about two. Because of the possibility of delay in the appearance of certain forms of fear, the method of forming a contrary habit before the instinct appears can be used very successfully. If a child from early infancy is accustomed to play with animals, if he is always put to bed in the dark alone, if he is interested in the thunderstorms, then particular forms of the fear instinct will be very much modified in their intensity, and may not appear at all.

Control of fear. — When the fear does show itself, there are three important methods of dealing with it, — the force of example is tremendous in inhibiting fear tendencies; second, the possibility of associating with the fear-inspiring situation some original satisfiers offers a means of lessening the fear responses; third, appealing to the child's reason and knowledge may be used as an additional method of depriving the situation of its fear-inspiring elements. The value of the method will depend largely on the age and experience of the child; the first is effective always, but the last only with children to whom facts, as such, have some significance.

Fear in its crude form should certainly be a waning emotion, but fear in its modified form is necessary for the maintenance of society. Fear early becomes associated with physical pain, and becomes one of the most common weapons wielded

by the adult in the control of the child. That fear of punishment, physical pain, has its place in the rearing of the child seems undeniable, for in the early days it is the only appeal that he can understand. It is equally true, however, that as the other instincts and capacities develop, this means of control should be gradually changed. Fear of disapproval, of the denial of companions, of deprivation of means of satisfying physical or mental activity, of being surpassed, of being the object of scorn of the group, each of these fears has its place until finally fear of losing one's friends, of falling short of one's ideals, of violating one's conscience, become some of the most powerful motives in the control of conduct.

With respect to the other primitive emotions, little can be said. The same general methods of control are effective as in those discussed. Some of them have already been spoken of in connection with the instincts with which they are often associated. Others will be considered in the next section. This confusion, lack of definiteness and difference of opinion, is a necessary concomitant of the present lack of knowledge and prevalence of theory and anecdote in the field of the feelings and the emotions. Because the psychology of the emotions is so little known, the lack of training, of development, and of refinement shows in this field — both in the æsthetic, and in the crude emotions — much more than in the field of the intellect. Lack of economy and lack of insight characterize our dealings with feelings, whether the original satisfiers and annoyers, or the more complex and violent emotions. Knowledge, much more definite and detailed, is needed before much progress can be made in this field.

Exercises

1. Write out a list of motives that may be used as incentives or deterrents with children under eight; with twelve-year-olds.

2. Illustrate each of the three methods mentioned of dealing with the fear instinct.

3. As in the discussion of treating anger, show how (1) the laws of learning, (2) the interposition of mental states, (3) the control of expressive movements may train the emotion of active kindliness, or of an appreciation of humor.

4. Observe a child experiencing an intense emotion. Notice the duration of the emotion and the type that succeeds. How do these compare with similar phenomena in an adult?

Questions for Discussion

1. How may training for technique in an art assist appreciation? How may it choke it?

2. By reminiscence, instance causes of childhood unhappiness. What suggestions do they offer as to dealing with children?

References for Reading

Strayer and Norsworthy, *How to Teach*, ch. 8.
Thorndike, *Original Nature of Man*, pp. 57–80.
MacCunn, *The Making of Character*, pp. 212–222.
Oppenheim, *Mental Growth and Control*, ch. 10.

CHAPTER VI

ATTENTION

ORIGINAL ROOTS OF ATTENTION. — The roots of the conduct and feelings of man have been found in his original equipment in terms of neurone connections and neurone behavior-series which in definite situations are ready to act. To make possible man's intellectual ability the same facts must be true in higher centers. Not only are there neurone connections in terms of the reflex arcs that make possible the reaching, hoarding, fighting, approving behavior of man, but there are also synapses between the sensory neurones and ganglia in the nerve centers whose action gives rise to sensations of all kinds. Still further, man by original nature has secondary connections between sensory and associative neurones, and between associative and associative neurones, which make possible all the further mental states of perception, imagination, memory, and judgment. These connections are ready to act just as truly as those leading to the instinctive responses. These secondary connections result in the so-called tendency to "general mental activity," or the power of "mental control."

Is man attentive by original nature?

Because these tendencies are the result of neurone connections ready to act, their activities not only bring about results that are satisfying, but the activity itself is one of the original satisfiers. To experience sensations and have things happen in consciousness is, in and of itself, satisfying to man; to see and hear and feel things happening in the physical world brings satisfaction, but to be the cause of such happenings is still keener joy. This "power of control," of "being a cause,"

carries over into the purely mental field because of the extended series of secondary connections which exist. "Not only making movements and thereby getting sensations, but also making an ideal plan and thereby getting a conclusion, making an imaginary person and thereby getting further imaginations of how he would act, and countless other 'gettings from doings,' are satisfying." [1] Experience and training determine just what the sequence will be, whether it will be the vain imaginings of the idler, or plans that will result in the building of the Panama Canal; whether frivolous gossip concerning clothes and one's next-door neighbor or ideals and judgments which make for power and efficiency. Nature provides only that the action of secondary connections is gratifying to man; man by his education and environment determines which of those connections shall be established as habits.

Significance of attentiveness. — To this original equipment of secondary connections is due man's intellectual and moral superiority. It is because consciousness, or mental life is felt as worth while for its own sake that man has gone so far in the field of intellectual attainment. So far as present opinion goes, it is in the possession of this instinct of general mental activity that man so far surpasses the lower animals. Consciousness in them merely plays the part of adapting physical responses to physical situations, and is worth while, satisfying to them as soon as it performs that function; whereas in man it not only connects mental states which serve as situations with mental states which are responses, but that process in and of itself, apart from the results, is satisfying. Just what the secondary neurone connections are which accompany the various types of mental states is not definitely known; but the mental states themselves and the changes which take place in them can be studied.

Arousal of instinctive attention. — Attention is the fundamental tendency which leads to other mental states. As a

[1] Thorndike, Original Nature of Man, p. 142.

matter of original nature, man has the tendency to prolong certain situations, and of disposing himself to be more effectively impressed by them. The situations to which he thus responds are those originally interesting, and his attitude toward them is that of attention. The situations to which, because of original equipment, he gives this interest and attention seem to be intense stimuli, such as strong blasts of wind, sharp pains, sudden stimuli which make sharp changes, such as loud noises coming in the midst of quiet, strange or unusual stimuli, rhythmic or cadenced rather than monotonous stimuli, moving objects, recurrent even if faint sense perceptions, stimuli that act as signals of organic needs and "situations to which he has further tendencies to respond as by flight, repulsion, play and the like." The tendencies of visual exploration, vocalization, and manipulation alone offer an almost infinite variety of situations. The bonds of attention, though many, are definite, and along the lines of the instincts and capacities. Omnivorous, general attention is not a gift of nature. The situations which later attract and hold the attention differ with the age and sex of the child, and it is these changes and differences that it is important for the educator to understand.[1]

What qualities in stimuli will arouse attention?

DIFFERENCE BETWEEN ADULTS' AND CHILDREN'S ATTENTION. In span or range. — The attention of a little child of school age, dependent as it is on this primary form of attention, has certain characteristics. Griffing [2] maintains, from the results of his experiments, that the span of attention is "a function of individual growth, reaching its maximum only when the observer is fully developed." This would mean that the at-

Compare adults with children in range of attention.

[1] As a knowledge of adult psychology is presupposed, the point of view of this section will be to emphasize the differences which exist between children and adults in the various mental states discussed.

[2] Griffing, On the development of visual perception and attention, Am. Jour. Psych., Vol. 7.

tention-span of a little child is smaller than that of an adult and that it increases with age. Although Whipple questions Griffing's method, there seems every reason to believe that his general conclusion is true: that whereas in one flash of visual attention the adult can apprehend four to five unrelated objects, the child cannot apprehend so many. Of course, this power comes both as a matter of growth and training, though the small effect of practice in the function seems to point to inner growth as the chief factor in bringing about the change. This narrowness of the attention-span may account for some of the difficulty that young children have in reading long words.

Difference in complexity of object.— The difference in range of attention between children and adults is more a matter first of difference in the complexity of the object of thought, and second in the lack of mechanical habits. The psychological law is that only one object of thought, one " conceptual system " can be in the focus of attention at any one instant of time. This is true for all ages, but for the adult the " object " may be a whole system; and the many relationships involved, the conditions which must obtain, the most important associations, — all these may be in the margin and color the focal point, whereas with a child, few of such connections can be held. With him, it is one fact, one object, one condition, rather bare and unadorned. Any one accustomed to deal with children knows how difficult it is for them to carry in mind more than one point at a time. Ask them in nature study to notice color and form, and attention is given to either one or the other, not to both; in geography, if they are asked to determine the occupations of people in a certain section by a consideration of the climatic conditions, and of the land forms, they are very likely to work through with just one condition in mind, unable to grasp the complex situation. Because of this inability to attend to a complex thought as a whole, the younger the child the stronger binds the maxim, — " Teach

one thing at a time." The first requisite in developing power in attending to a system of thought as a whole is that the teacher shall know, first, the child's limitations, and second, just how complex is the situation. If she knows that the thing to which she is calling attention involves just so many relationships, she will not be nearly so likely to ask the impossible of the child, and in consequence to bring about confusion and disorder. The process must be a very gradual one; at first, each thing is learned almost alone and thoroughly before it is brought into a complex situation as an element; later, as power increases, the number of elements or relationships may be increased.

Difference in mechanical habits present. — The second reason for narrowness of range in the child is a lack of mechanical habits. An adult can use eyes, hands, and feet in running his machine, smoke, listen to a conversation and criticize it mentally all at the same time. Another can read the music and words of a song, get the meaning, use voice with artistic effect, use hands and feet in the piano accompaniment and still attend to the way the audience is listening. The adult does many things at the same time, and therefore apparently has a wider range of attention because several of them are mechanical habits, such as need no special attention except to start them or to overcome an obstacle of some kind. But with the little child the things we adults do so easily are matters of serious attention and effort, and very seldom can more than one thing be done at a time. If in reading he pays attention to the pronunciation of the words, or the holding of his book, or the inflection and accent, he loses the meaning; and if the meaning is in the focus of attention, the others suffer. If in composition work attention is given to "good writing," the content suffers. If in arithmetic the numerical combinations have to be thought about, or the form in which the work is put on paper, the problem involved may be entirely lost sight of. If the child is talking of something he saw or heard, the

hands which should have been busy sewing, or chopping wood, or washing dishes, or buttoning boots are idle. Attention can be given only to one thing at a time; any number of mechanical operations may be carried on at the same time, but only one that requires thought. Progress is made, then, as operations are made mechanical; and the faster this occurs the better for the fundamental operations in all lines of work. Here again it behooves the teacher to analyze the situation, to know just what she is requiring of the child, and then to remember that nothing becomes mechanical without much attention, drill, and practice, even at the cost of possible monotony. Because the adult has for so many years done so many things mechanically, he has forgotten that once he had to learn to do those very things, and that learning took, for the time, his full attention.

In intensity. — In intensity, or concentration of attention, children and adults differ. The child on the average does not get so deep into his subject as the adult does. The waves of attention seem to be less perpendicular in the child than in the adult, the crest not rising so high, nor the depression sinking so far. He is more likely to be distracted by disturbances of any kind. No matter how deeply absorbed or interested he may apparently be in play or work, he still is " all ears and all eyes " as compared with the adult. A word spoken, a sound in the street, a movement made, and his attention flashes to the distraction. Of course, this is not always true; he can become absorbed, deeply absorbed in his play, but that is not the usual state of affairs as hour after hour he occupies himself with all sorts of things; nor can such absorption be compared in depth to that of the adult engaged in some interesting occupation, lost to the world, forgetting his meals, engagements, to whom " the house could burn down, he would not know it " might apply. Children unquestionably lack the power of concentrated attention which characterizes the average adult.

Compare adults with children in intensity of attention.

In duration. — Closely allied to this lack of concentration is the shortness of duration of an act of attention. Even when no distraction occurs, a child very soon tires of one occupation, or one line of interest. His attention wanders, flitting from one thing to another, dwelling on each for but a moment. The chief cause for both the lack of concentration and the shortness of the period of attention is the poverty of mental content. Since attention cannot be held on the same object for more than a few seconds, the object must change or the line of thought develop, if either is to hold the attention. Because of his want of experience and knowledge, the child has few associations in connection with any one situation, he sees but few possibilities, and consequently he soon exhausts the situation, whether it be mental or physical. He cannot become very much absorbed in it even under the best conditions, for it has no depth; nor can he continue to attend to it for very long because he comes to the end of his material. If there are other factors which serve as interferences, and there often are, — *e.g.* fatigue, need to inhibit other impulses, physical discomfort, — the lack of concentration and the wandering of the attention are both increased.

Compare them in duration of attention.

Change with maturity. — The younger the child the more closely he conforms to the above description. Power comes with age because of the added possibilities each situation possesses, just as a matter of mere experience; but increase of power is hastened if associations, facts, relations are definitely made in lines where attention is desired. The more knowledge an individual has in any line, other things being equal, the greater is the probability both of the depth of his attention and the length of the period of attention. This is clearly seen in watching children study. Left to themselves they read over the lesson, once, twice, or more times, and that is the end of it; they have come to the end of their resources, there is nothing left in the material so far as they can see, and

their attention wanders. The value of various suggestions and questions in connection with their study is evident, if merely as a means of holding attention to the material for a longer period of time. Another practical application of these facts is its bearing on the length of school periods. The younger the child the shorter the period; the less in any given subject you can call on the child's experience the shorter the period. The length of period, therefore, must vary not only with the age of the child, from a fifteen-minute period in the kindergarten to a forty or forty-five-minute period in the high school, but also with the character and newness of the subject.

Change with practice. — Not only will experience and knowledge of a subject increase the power of concentration and the length of the attention period, but practice in attending also plays a large part. The child who has never been required to attend for more than fifteen or twenty minutes consecutively, despite the presence of all the necessary conditions, finds it very difficult to do so. Adults in general have so fixed their habits of attention through mere usage that one hour, two hours and a half, or some other length of time is their " working period," at the end of which they become restless, their attention wanders, and their time of good work is over. Habit is a large factor here as elsewhere; and if power is desired, if rapid progress is economical, then a habit of protracted attention-giving must be formed by the application of the laws of learning, exercise, and effect.

In breadth of field. — Children and adults also differ in the breadth of the field, the number of lines along which attention is freely given. The child's attention is more omnivorous than that of the adult. He seems to attend to anything that is novel until the novelty wears off, and as he is a newcomer lacking experience, everything is new to him. He is in the grip of his instinctive tendencies, and each one opens up a field of atten-

Compare adults with children in breadth of attention.

tion. This is a natural correlative of the two characteristics first discussed; with lack of concentration and the short attention periods, of necessity the field over which attention wanders must be broad. For the adult with his broader experience, most of the everyday things have lost their novelty, and his power of concentration, due as it is to knowledge and habits, serves to lessen the number of things to which it is necessary to attend. Adults are bound by their habits; they have lost the characteristic which in childhood is so charming, that of being interested in everything. True, they accomplish more, delve deeper because of this power, but they have also narrowed their field of attention. Every habit, every interest, while it is an aid in the field to which it applies, is also a limitation. This condition of affairs is very evident if one starts to interest a primary school class in something adapted to their experience and understanding, and then tries to do the same thing with a class of adults. This breadth of interest and attention on the part of the child is of the utmost value and significance, educationally. Because of it, the actual interests and habits which are fixed, which are selected from the mass and made permanent, becoming the foundations of character and conduct and giving the bias to life, — these are determined by the environment and training. All nature does is to provide the fund of tendencies toward attention in all sorts of lines; education must do the rest. The effect of the narrowing of interests and attention due to this very habit-formation must be borne in mind; because of it, the teacher must see to it that Herbart's " many-sided interest " becomes a fact in the life of each child. Broad and manifold interests fixed in childhood are the cure for narrowness and bigotry in adult life.

In type of attention. — The attention of the child is primarily of the sensory type; that of the adult is more largely intellectual. The fact that the numerous instincts, concerned as they are with sense impressions and movements, serve in

childhood as the chief stimulants of attention, accounts for this state of affairs. The root of intellectual attention is, of course, in the satisfyingness of the secondary connections; but even here the source of these connections is for many years a sensory one. Observe a child and an adult out for a walk. The child is alive to seemingly every sense stimulus; seeing, hearing, the feeling of different movements, smelling, tasting (if allowed), handling, — while the adult is conscious of something in his surroundings, but much more absorbed in the connections, images, associations, and memories which each sense impression calls up. The practical outcome of this difference is evident. The starting point for habits of attention is in the sensory field. Ideas as concepts and abstractions become capable of holding the attention only as they are the outgrowth of experience in perceptual form; and this development is a very gradual process.

Compare adults with children in the kind of thing attended to.

In ability to give voluntary attention. — Perhaps the most vital difference in attention as the individual passes from childhood to adulthood is the increased power to stand the strain of effort in connection with the act of attention. Some acts of attention are spontaneous. The object of attention appeals to the individual's consciousness, either for its own sake or because of some value attaching to it, in such a way that it satisfies him. There is, as Dewey puts it, an identification between the individual and his object of thought, because it satisfies some need. On the other hand, there is the type of attention which is forced. The object does not identify itself with some felt need, but because of duty, or social pressure, or ideals, the individual feels he must attend, despite the effort involved. There is division, not unity, in the conscious state. A child lacks power to give forced attention, to stand the strain of effort involved and to attend in spite of it. Probably this lack of power is due both to physiological reasons and lack of

Compare them in power to give forced attention.

practice. The natural, childlike form of attention is the spontaneous; forced attention comes, if at all, with age and training.

Value of forced attention. — The respective values of spontaneous and forced attention is a question still open to discussion. The very characters of the two types of attention make it true that only when attention is spontaneous can it be concentrated and sustained. So long as it is forced, part of the energy is used in keeping one's self at the task; and this added fact, that this effort is so taxing that forced attention can be held for only a few seconds at a time, makes it impossible to do work of vital worth when this type of attention is employed. The work that counts in the world, the work that discovers new principles, makes new applications, touches the hearts or wills or consciences of men and women is always done by spontaneous attention. As has already been pointed out, however, the spontaneous attention natural to childhood is closely connected with his instincts; and since these are selfish and crude they do not fit an individual to live in the civilized life of to-day. In order to raise spontaneous attention from the sensory, individual, often selfish, level to the level of the intellectual, the social, and the ideal, forced attention is a necessary means to an end. The natural man does not look forward to remote ends, nor does he deny himself now that he may reap greater benefits later; nor does he suffer individual privation in order that the group may profit — that comes only by training and involves forced attention. This type of attention is necessary, then, in the present scheme of human life for development, but it is only necessary as a means to an end. The end must always be spontaneous attention; instead of spontaneous attention on the level of the instincts, spontaneous attention on the level of the greatest and best ideals. This is the aim the teacher should have in mind in developing the powers of attention in children.

Should we train children to give forced attention?

Effort and interest. — One of the greatest mistakes education has made has been to lose sight of the relation to each other of these two types of attention. The old education believed in the value of effort for its own sake; whatever was hard was therefore considered good. From the very character of the type, though, this cannot be true for itself alone; forced attention accomplishes no result, it but opens the door to possibilities which spontaneous attention left to itself could ignore. On the other hand, the soft pedagogy of to-day gives a fictitious value to that only which is pleasurable, and counts effort, therefore, as harmful and valueless. The truth lies between the two, and the recognition of forced attention as a means to an end, as a stepping stone from the level of the instinctively interesting to the level of the ideally interesting, from the level of impulse to the level of judgment, from the level of individual interest to that of social well-being, — this thought is one of the most important contributions of child psychology to modern education. Because of the recognition of the peculiar value of forced attention, the need for motivation is being felt very strongly. For the child to desire an end that is valuable to him, and then to realize that the path to it involves the effort of forced attention, is to give the true value to the means, and also to train the child in the power of standing the strain when the end makes it worth while. This sort of training prepares him for life situations, gives him perspective, helps him to judge values. The child who, keenly desiring to build a boat that will float, feels his need of the knowledge of certain measurements, and, despite the effort needed, sets about learning them; the child who, desirous of making her mother a Christmas present, finds it does not look pretty because her stitches are too large, and so practices making small stitches although it is an effort to do so; children who find that it pays not to spend every penny as it comes because later they can buy something they really want, although the waiting and denying themselves are un-

pleasant, children such as these are learning the true value of forced attention, and are forming habits which make for strong characters.

Incentives and attention. — Spontaneous attention to things that are most worth while may be gained by other means sometimes, as well as by forced attention. Although the multiplication table in itself may not attract spontaneous attention, still, if ability with it serves as a means of display the business of learning it may arouse that type of attention. Reading itself may seem a distasteful task, but if one can beat one's neighbor it may be intensely interesting. Obeying one's mother may involve great effort, but if she be the queen of the land and I her devoted slave, all commands or requests are eagerly looked for. Activities of all kinds derive value if they are closely associated with or involve the activity of one of the original satisfiers. As James points out, the interest involved then spreads over and imparts its impetus and character to the material with which it is associated. Derived interests of this kind involve spontaneous attention. Sometimes the incentive may later be dropped, and the interest thus started continue. More often, incentives of some kind are needed all through life. There are multitudes of things to which the adult gives spontaneous attention, not because they are of value in themselves but because of some value attached to them. This must necessarily be true because of the make-up of human nature. The suggestions here would be, in so far as incentives are necessary: (1) choose those natural to the child's stage of development, work with nature, always making use of what is there; (2) choose those most natural to the subject to which the attention is desired; (3) choose those that will appeal to the greatest number; (4) choose those that are permanent, *i.e.* will be found in life-situations, as well as school-situations; (5) choose the highest that will work.

How do derived interests help develop the power to pay attention?

Curiosity and attention are bound up together, and the facts usually referred to by the term " curiosity " probably are the tendencies of vocalization, visual exploration, and general mental activity. There is probably no separate and distinct instinct of curiosity. These other tendencies have already been discussed, and all that need be said here is to emphasize once more that children do not have to be cajoled into thinking; mental activity is its own reward. The cajolery and the incentives are necessary when the nature of the child and the requirements of society come into conflict and the conflict is more often an imagined than a real one. If teachers would only make use of the rich fund of instinctive interests that are actually present, instead of substituting for them formal and artificial requirements and incentives, child nature would be preserved and education proceed apace. Gesell sums up the matter when he says, " It is time to have a reckoning, to realize before it is too late the futility of pushing nature. There are certain basic instincts implanted in childhood which wedge their way through obstacles to the accomplishment of their purpose. The little child comes running to school pushed by curiosity, energized by feeling, tingling with response to sensation and reveling in images of past experiences, but the teacher discards these sharp-edged tools which make early workmanship easy, and substitutes dull drills." [1]

TRAINING OF ATTENTION. — To develop from the instinctive tendencies to attention habits of sustained, concentrated, and spontaneous attention to the things in life that satisfy best the wants of the individual and the race; to cultivate the power to stand the strain of effort to situations where the end is worth while and this is the best means of attaining it; to make use of the instinctive interests in gaining derived values for things of fundamental importance in themselves but for the time being of no value to the individual; — these objective ends make up the latter-day problem in education.

[1] The Normal Child and Primary Education, p. 308.

Questions for Discussion

1. What does a teacher mean when she says, "You must learn to pay attention"?
2. Why do such things as flapping window shades, the starting up of the street-organ, a person turning to use the blackboard, a different pitch of voice attract children's attention?
3. What means would you take to help children "learn" to attend?
4. What is the value of having children assume attitudes of attention in the classroom?
5. Illustrate the psychological and the practical difference between gaining attention and sustaining it?

References for Reading

Bagley, *The Educative Process*, ch. 6.
Dewey, *Interest and Effort in Education.*
W. P. Pillsbury, *Attention.*
Any standard psychology, chapter on attention.

CHAPTER VII

SENSE PERCEPTION

ORIGINAL ROOTS OF PERCEPTION. — The human being is equipped by original nature with certain tendencies in terms of connections between sense organs and certain brain centers whose action results in the mental state of sense perception. The structure of these sense organs, together with the delicacy of the connections between them and the brain, determines to what situation the individual will be sensitive, and what sensations will be aroused. The eye is sensitive only to certain vibrations of ether; at each end of the spectrum are vibrations of which the human race is unconscious. Insects are sensitive to musical tones to which the human ear is insensitive. Dogs respond constantly to slight differences in odors which it is impossible for human noses to detect. Original nature sets limits within which sense perception must be developed, if it is developed at all.

DEVELOPMENT OF PERCEPTION. — The development which takes place in sense perception from babyhood to maturity is due to several causes. Mere inner growth provides for their perfection of the sense organs and their connections; experience provides the conditions for consciousness of objects to be evolved; changes in attention result in greater clearness and definiteness of the mental states; practice gives greater power of discrimination in all the departments of sense perception.

At birth the sense organs themselves are at different levels of perfection. The organ of taste, and the skin senses are just ready to perform their functions with a fair degree of

accuracy; but the eye, ear, and nose are very imperfect as organs. However, inner growth perfects all the sense organs during the first two or three years of a child's life, so that most of the changes which occur in sense perception during school life are due to the other causes. The kind of mental life aroused at first by the action of these connections can only be guessed at. Nothing like a consciousness of qualities or things or relationships can be present. James describes it as "a great, blooming, buzzing confusion." Certainly it is an undifferentiated mass of mental stuff, in which the feelings of bodily pain and discomfort stand out like spires. It probably is not very dissimilar from the low level of mental action felt sometimes in a slow awakening from sleep or recovery from anæsthesia — without its sophisticated self-consciousness and efforts to remember, of course — where a diffused feeling of warmth and well-being, or pain and cold, quite unlocalized, appears as a simple satisfier or annoyer. Sounds impinge on consciousness in a dislocated, meaningless, noisy way; vague appeals to vision occur, with shape and distance unintelligible, mere dark and light long preceding color.

By differences in simultaneous sensations. — From this confusion comes, in time, the well-ordered life of clear perception of the adult. In the first place, the change from mere sensation level is brought about by the repeated action, and varied interaction of the different sense organs. When a baby handles his rattle the tactile and muscular senses in hand and arm are stimulated; when he shakes it, the sense of hearing as well, and the sense of sight as his hand comes within the line of vision; as he hits himself with it the tactile sense in other parts of the body is aroused; as he puts it in his mouth further tactile, perhaps gustatory sensations occur, but the object may have disappeared from sight. When some one else shakes the rattle before him, some, but not all, the sensations are repeated. When other objects that do not rattle are

How do percepts arise from sensations?

grasped there is another grouping of simultaneous stimuli. The rattle may be pink, hard, and smooth, the ball pink, soft, and fuzzy, the toy lamb white, soft, fuzzy but of a different shape — and so on through the endless combinations of appeal to different sense organs, or to different qualities sensed by the same organ. If his rattle stimulated only the sense of touch, and that always in the same way, it is doubtful whether anything more than indeterminate sensation could result from that stimulation. But because the rattle stimulates more than one sense organ simultaneously, and never stimulates them in just the same way, the result in consciousness is the feeling of " thinghood," or sense perception. In order, then, for definiteness to result from confusion, a world of " things " from chaotic sense feelings, experience must afford conditions of the simultaneous and varied stimulation of several sense organs by the same object. To the extent that this kind of experience is lacking or limited must the development of sense perception be handicapped.

By improved attention. — In the second place, the improvement which takes place in attention makes for clearness and definiteness. So long as the attention is uncertain, wandering, and superficial, flitting with great rapidity from this to that, pausing nowhere for more than a few seconds, objects, as such, make but a hazy, incomplete, and often inaccurate impression. To get clear outlines, definite and accurate qualities, the attention must be caught and held. Defective attention, such as a " scatterbrain " has, for instance, results in deficiency in sense perception. In the third place, practice in noticing things and their qualities, in discriminating fine likenesses or differences between objects, makes for development in sense perception. Any environment which necessitates or encourages such discrimination must develop a fund of sense knowledge of great value; and a corresponding lack in such stimulating conditions results in a lack of mental content of the kind fundamental to all intellectual growth.

Resulting differences between children and adults. — The chief differences between the sense perception of adults and of children grow out of these facts of development. In general, *children lack in richness, in definiteness, and in detail* of sense perceptions. Despite the fact that there have been tremendous strides during the first few years, still, the ignorance and lack of observation of the common everyday objects by children of school age are appalling. G. Stanley Hall in his historic article on " Contents of Children's Minds " and likewise several German investigators, both preceding and following him,[1] have reached results that seem almost incredible. Some of the misconceptions are due to mere verbal analogies, *e.g.* oats grow on oak trees, and butter comes from the butterfly, others are due to the activity of the child's imagination and his tendency to interpret everything in terms of his own experience, *e.g.* thunder is God groaning, clouds are smoke; but a very large number are due to simple lack of seeing, hearing, and feeling accurately and with attention the things that are in his daily life. It is hard to believe that 53 per cent of Boston school children tested had never seen a sunset, 30 per cent never saw clouds and 55 per cent were ignorant of the source of wooden things; and yet when a high-school graduate believed that apples were dug from the ground as are potatoes, and a youth that had lived all his life on a farm could not tell how a horse lies down, and a country girl did not know a robin, one begins to realize how much of false sense perception may go uncorrected. Hall in summarizing his results says, " There is next to nothing of pedagogic value, the knowledge of which is safe to assume at the outset of school life "; and again, " the fact that children see objects a hundred times without acquiring consciousness of it suggests that we need to converse with children about the commonest things." Of course, with this great lack of perception of

How do children differ from adults in perception?

[1] K. Lange, B. Hartman, J. Olsen, and E. Meumann.

things, there must naturally go an even greater lack of perception of qualities. The consciousness of clear-cut blues or reds, of curves or straight lines, of musical tones or noises, of softness or hardness, as well as space and time relations are characteristics of the adult rather than the child. He reaches an appreciation of elementary sensations only as a matter of analysis, and as a result of the working of the factors influential in the development of perception.

Another striking difference between the perceptions of children and adults is the *difference in the amount of stimulus necessary to call up a percept.* The child at the beginning needs a large amount of stimulus, and needs it to be given in just the same way in order that the perception be of the same object. Mother in a different dress, or appearing suddenly in new surroundings may not be recognized, and certainly it is a long time before mother is perceived by just seeing the back of her head, her silhouette in the distance, or her walk. The older the individual, the greater his experience with the situation, the less the amount of stimulus needed to call up the percept. This fact of mental development is particularly noticeable in connection with reading. The child needs to read every word in order to get the meaning of the sentence, every sentence in order to get the paragraph, whereas for the mature individual the important word or two in the sentence, or the topic sentences in the paragraph are enough to furnish the sensory clue to a full perception. It takes time for the child to evolve his types or standards in connection with perception. As he accomplishes this end, fewer and fewer characteristics, less and less of sense stimulation is necessary for him to proceed.

A third difference between children and adults in their perception lies in *the power of "mind's set," or the passing mental content to determine the percept.* Every one is influenced by the state of mind he is in as to what he will think in the next few minutes, and a previous mood is a strong factor in deter-

mining his point of view. We all tend to see or hear or feel what we expect; witness the tragic results that have come from simple fraternity initiations. But the child, because of the characteristics of his attention, is even more influenced by the passing mental state. Two important practical precepts grow out of this fact. In the first place, it is very necessary that with a child the aim of the work be kept very clearly in mind; he should know very definitely what he is to look for or to do if results worth while are to be obtained. In the second place, new material in any line should not be given until the child has had time to warm up, to adapt himself to the new line of work. To plunge a class immediately into new work in geography or reading when their thoughts have not yet had time to get out of the arithmetic system, leads to a waste of time and confusion. There is need of "preparation" of the child's mind by getting him into the other system before new material is presented.

Cause of Illusions. — Because of the strength of the passing mental content, children are more subject than adults to one type of illusion. A child in the dentist's chair is hurt long before the instruments have touched his tooth. Sent to watch for father, he sees him several times before father arrives. Having talked about the bluebird, he sees the flush of its wing and hears its call when it may be only a robin. If he is told by some one whom he loves or respects that such and such a thing is there, the normal child of seven or eight will see it or hear it. The suggestibility of children under ten has been proven by experiments in many fields, but every teacher has evidence of it day after day in her own classroom as children see and hear and feel what the questions or talk have suggested. On the other hand, children are probably freer than adults from illusions dependent on habitual interpretation of phenomena. The adult, while reading rapidly, is more likely than the child to overlook a misprint in spelling in a word familiar to both, or is sure he read the name of his

destination on the front of the street car yet finds himself up the wrong avenue, or fails to hear the transposition, omission, mispronunciation, or whatnot in a time-honored quotation which sends the child into mirthful convulsions. It is because of this difference that a child is sometimes called more literal than the adult. If his mind is not very much taken up with something, if it is not " set " in a certain direction by suggestion or aim, he is likely to see the facts as they are, whereas the adult may be influenced by life habits into a misinterpretation.

How does perception develop?

Specific development. — Tracing the development of the perceptive power of any one kind is extremely difficult; the results of different investigations stress different factors. However, certain facts seem to be generally accepted. " The eye in early childhood is an incomplete eye, naturally underfocused and poorly adapted for near work. But, as general bodily maturity approaches, the eye under optimal conditions tends to become emmetropic. " [1] Differences in *brightness* are perceived at about six months of age, and during the second half year, reds and yellows are discriminated. Blue is perceived with greater difficulty according to most investigators. Power in discrimination of both *colors* and brightness improves up to about sixteen or seventeen years of age. Several observers have found that girls and women exceed boys and men slightly in this capacity. As to *space perception*, there are very decided differences of opinion. Sandiford says, " Judgment of distance with the eye is non-existent in growing babies (they grasp at the moon), but by the time seven or eight years of age is reached, it is probably as accurate as in adults." [2] Thorndike, on the other hand, says, " It has generally been assumed that man has to learn to respond appropriately to distance, — that, for example, a child will reach for the moon as readily as for a similar

[1] Whipple, Manual of Mental and Physical Tests, p. 139.
[2] The Mental and Physical Life of School Children, p. 122.

bright object a foot or so away. But I am unable to verify this opinion. Of perhaps fifty observant parents whom I have questioned, not one could be sure that his children ever reached for the moon." [1] On the whole, space perception for short distances, helped out as it is by hands and eyes, then by locomotion, is earlier and better developed than is color perception. Ziehen and Meumann found that even at six years of age considerable accuracy in judgment and freedom from visual illusion had been attained. Conceptual experience of such distances as we express in miles is, of course, a much later development, as are also interpretations of flat, perspective drawings, or of the size of unfamiliar objects when shown only in pictures.

In *perception of weight*, it is probable that there is not much change with age, and that practice has comparatively little effect on the power of discrimination. In *skin sensitivity* the consensus of opinion is that children are much more sensitive than adults, and that practice improves the capacity enormously. This experimental evidence is borne out by the fact that in some industries where delicacy of touch and fineness of discrimination are necessary, such as knotting willow plumes, children have been in great demand. The exquisite sensitivity of blind people's fingers has given rise to the expression that they have " eyes in their fingers," and this skill has come from constant practice.

Sound perception is supposedly but poorly developed in the first few years. Investigations have, however, been largely confined to pitch discrimination and to ability to give a melody from memory or direct imitation, with but little attention to judgments of intensity, volume, direction, or quality of sounds. In pitch discrimination, besides a considerable range of individual variation, we find improvement with practice and with age, though with arrests in progressive sensitiveness at about the ages ten and fifteen. Fewer than forty per cent of

[1] The Original Nature of Man, p. 50.

children under six can give a melody from memory according to Monroe;[1] this capacity obviously improves a great deal with age and practice. *Perception of rhythm* may appear in year-old infants, though it may be noticeably deficient as late as seven years. Duple and quadruple time is naturally easier than triple, especially to reproduce. The longer beat in periods and cadences, whether in music, prose, or poetry, is frequently not felt till the adolescent period when there is an added interest in and appreciation of many sense perceptions. Perception of long periods of time develops but slowly. A four-year-old is confused as to yesterday, tomorrow, next week. Meumann thinks that all complex time concepts such as last spring, day before yesterday, a month ago, are quite unintelligible to a six-year-old. Arithmetic books to the contrary, the eight-year-old's day is from waking time till dark, containing a varying, indefinite number of hours. Not till nine or more birthdays have passed does a child begin to regard a year as other than a wonderfully long period, and to date events in his past either with any great accuracy, or over long intervals.

SENSE ORGANS. — General psychology as well as common observation emphasizes the fact that all knowledge is dependent upon sense perception, and all learning is conditioned by it. If this type of experience is so valuable, obviously the first thing in the education of children along this line is to be sure that the organs of sense are in a condition to be affected by the stimuli presented. Defects of eyes or ears have been found to mean a handicap to the child of such a far-reaching nature that detection and correction of such defects is one of the primary duties of school officers. Extreme defect in either of these senses has caused children to be considered stupid and even mentally defective, when the only trouble was inadequate sense organs.

What sense defects are commonly found?

[1] Ped. Sem., Vol. 10.

Eye defects. — The percentage of defective eyes among school children is very large, but the exact figures will vary with the kind and delicacy of the test used. Some investigators have found only 19 per cent having defective eyes, others, at some ages, as many as 92 per cent. Comparing statistics from England, Russia, Japan, and several parts of the United States Rusk [1] sums it up by saying "from 10 to 30 per cent of the school population have vision sufficiently imperfect to command correction by glasses." The most common defect, also that definitely increasing with age, but fortunately easy to discover, is *myopia*, or shortsightedness. This defect is due to a too long diameter of the eyeball from front to back causing the light rays to focus in front of the retina. The opposite condition — too short an eyeball with the rays brought to focus behind the retina — produces *hyperopia*, or farsightedness. Here there may be no loss of acuity of vision, and with some effort the eye may be forced to do the work required of it; but this, so far from being a benefit, as some people imagine, will, if uncorrected by convex lenses, induce a fatigued condition of the ciliary muscle which regulates the accommodation of the eye. A third defect, known as *astigmatism*, is due to uneven curvature of the cornea or perhaps of the lens of the eye itself. Here too there is danger of constant strain on muscles which may result in reflex disturbances of a serious nature. These last two types of defect are not usually discovered by the ordinary tests of vision applied in the schools since they are designed to test acuity. Consequently, children possessing them may go on year after year using up their energy, perhaps breaking down their nervous systems in the mere effort to see.

There are other eye defects shown in lack of balance or control in some of the six muscles that move the eyes in their sockets. The most serious is squint, *strabismus* or "cross eyes," which generally results from excessive hyperopia in one eye

[1] Introduction to Experimental Education.

causing it to be gradually disused, therefore turned in or out. As the double vision thus experienced is confusing, the child soon comes to disregard the retinal image of the squinting eye; this further aggravates the trouble, since power to focus and to move is lost in time, from disuse. Prompt and early treatment is of the highest importance if vision is to be retained. As muscle strain in the eyes may result from the less easily detected hyperopia and astigmatism teachers should be on the watch for symptoms in children such as frowning, smarting or watery eyes, complaints of blurred print, bad posture over work. Reflex symptoms exist too, such as headache, particularly in the frontal region, perhaps nausea or other forms of indigestion, neurasthenia, motor disturbances, and general emotional instability.

Another, rather different eye defect is that of *color blindness* found in about 4 per cent of boys and less than 1 per cent in girls. Red-green blindness is the most common form. It may be in one eye or in both, and therefore may go unsuspected till a careful test is made. It is nearly always congenital, and is incurable, though children may learn to recognize some reds or greens by means of differences in brightness.

Ear defects. — Defective hearing is not so serious in its results on the nervous system of the child as is eyestrain, but, when it exists, it interferes with the development of perceptions and therefore of knowledge. A number of investigators find about 20 per cent of school children defective in one or both ears. Such children frequently show an imperfect language development, and, because they fail to get much of the instruction in the schoolroom, are apt to be considered dull and get retarded in school progress. From being partly shut off from the play of normal children, they are in danger of growing up " queer," anti-social, bad-tempered, subnormal physically and morally. Once the condition is detected the cause of deafness should be sought for by the physician. Sometimes the removal of tonsils and adenoids will secure

relief; but if treatment will not effect a cure, deaf children need to be taught by special methods, therefore, for a time at least, segregated.

It is evident from these facts that the two senses of sight and hearing must be carefully tested by experts who understand the dangers and the handicaps that various types of defects cause, if children's health is to be preserved and their physical equipment be such as will make possible the accumulation of a fund of clear, accurate sense impressions.

TRAINING IN PERCEPTION. Necessity of training. — To have attended to the condition of the sense organs is only a beginning, however. Not only must these be in good shape in order for proper perception to be developed, but children need training in the methods of learning through their senses. It is through the action of the sense organs that all the mental stuff comes from which is built the world of knowledge, of imagination, of reason. It is fundamental to intellect, to character, and to conduct. Limitation of experience in this field, or incorrectness of perception, must result in a lack of some kind in the more complex realms of mental life. All this is known intellectually by teachers and educators, but it is far from being a conviction with them. Far too little time and thought and preparation are given to the refining and enriching of the sensory experience of children. Yet much of this is needed if the child is to enter into and possess the world of things. He must be given time to touch, look at, listen to, feel, lift, perhaps smell and taste, many objects. In nature study he must learn to perceive form, color, number, relative size, position by looking, touching, pulling apart, feeling the texture, getting possibly the temperature, odor, and taste. In music he must have tones of varying pitch, intensity, duration; he must hear the difference between a note sounded on piano, cornet, violin, organ, flute, human voice of different qualities; he must feel the effect of groups of successive or simultaneous

How is perception trained?

tones with all possible variations again of pitch, intensity, duration, rhythm, and color value before he has what we call an "ear" that is cultivated. In spelling he must look at, pronounce, write, and listen to the letters, syllables, and words. In a cooking lesson, amount, color, proportion, texture, space arrangement, distance must be tested by eyes and hands, while ears as well as nose may help judge processes before taste sits in judgment. The hands must acquire skill in movements such as kneading, egg-beating, and this depends on discrimination of cutaneous and kinæsthetic sensations. All this needs careful planning by the teacher. Left to themselves children's percepts are hazy, incomplete, and inaccurate. Definite provision and preparation are necessary if the perceptual growth of children is to be what it should be. With all its faults, the Montessori system has done much in once more calling attention to the need for more training in sense perception and discrimination, especially to the gain to the very little child in using touch and movement to help out the eye judgment.

The whole question of so-called sense training or observation lessons is bound up not only with the facts of perception, but also with those of attention, memory, and the formation of concepts. It is convenient, however, to treat of it at this point rather than later.

How do we "observe"?

Types of observation. — Observation may be of three kinds, according to Meumann: (1) *inquiring, or purposeful*, to which one comes prepared with varied points of view and definitely directed attention. The act of perceiving may be either leisurely, as in looking at a picture or specimen, or momentary, as in watching an event in rapid progress, or listening for a sound. In the latter case the attention is more highly concentrated, and after-images and immediate memory are relatively more important; (2) *non-purposive*, surprised, forced upon one by some sudden occurrence in the environment; (3) *purposive*, but passively expect-

ant, in which one is definitely attentive, open to any and all impressions, to which one comes with no points of view clearly in mind. In speaking of sense training, we usually mean the first or purposeful type. In this the function of attention is firstly, to hold in mind the "goal-idea"; secondly, to increase the clearness to the sense organs and to consciousness of the details observed; thirdly, to fixate in memory the things noted; fourthly, to assist in classifying or analyzing one's impression.

Individual differences in perception. — People differ in their ability to concentrate their attention and to resist distraction. The changes in children as they grow older in their power of attending will make a difference in their capacity to observe. People differ, again, in the amount perceived and in the speed with which they can reproduce what was presented; therefore as children's span and range of attention increase we may expect improvement in the amount and accuracy of their observing. People differ also in their habit of using the first or the third type of observation. The first is productive of definite, but sometimes prejudiced results in a narrow field; the third may be vague in intent and method, wide in scope and serves well as a preliminary stage in a new field of inquiry, revealing lines of interest that may be followed up by using the first type of observation. Children need systematic training if they are to be habituated to the method of the first type, and accomplish ends worth while. People differ further in their suggestibility under questioning that follows the act of perception. Children under twelve are much more suggestible than are adults, therefore their reports of perceptual experiences are likely to be more inaccurate the more they are interrogated with "leading" questions. Another difference is to be noted between the subjective observer, who is misled by his expectancy, his imagination, and his interpretations, and the objective observer, who readily distinguishes what is

How do children differ from adults in their observation?

actually perceived from what might be subjectively added. This difference in type is found among children too, though their fluctuating attention and intensity of interest may make them less consistently of one type. Girls are more subjective than boys.

Improvement in observation. — In general, natural ability to observe improves steadily up to about fifteen years of age, after which it declines. Defectives reach their highest point earlier and then often revert to the ability they possessed at eleven. Spontaneous descriptions of perceptual experiences double in amount between the ages of seven and fourteen, according to Stern, and nearly triple between seven and nineteen. " Increase of spontaneity in observing and noting is one of the most essential characteristics of mental development." [1] When pressed by questioning further facts are remembered and reported on, but after fourteen years of age no improvement in the total amount thus described is found.

What stages of development in observation have been noted?

Children of different ages notice different sorts of things, if we can judge by the items they will freely report on or ignore. Under seven a child observes disconnected objects or persons and enumerates rather than describes them. To this " substance " stage succeeds one of greater attention to actions. Girls more than boys are apt to show a sudden transition from the first to the second, as also from the second to the next stage. A ten-year-old will begin to report on spatial, temporal, and causal relationships, but not till well after twelve does there come the stage of qualitative analysis of the objects presented. Color, contrary to presupposition, does not appear in the accounts given by young children; in fact a child may be fourteen years old before telling of it spontaneously. Girls will tell better about persons, boys about things, a distinction that comes out also in the noticing of

[1] Meumann, The Psychology of Learning, p. 138.

color. Boys are more accurate in their reports than are girls, but narrower in their range. Accuracy increases with age and practice, though here again the sexes develop differently — the boys improving most during the years seven to ten, the girls from ten to fourteen. Training to observe by different categories, such as number, color, form, has an immediate but probably not permanent effect if the category used is in advance of that which is natural to the age.

Teaching suggestions. — Some applications of these facts would be: first, since the feeling of certainty is no measure of real accuracy of memory, children should be trained to rely more on repeating the sense impression and comparing their memory directly with the perceptual experience. This habit of " taking another look " is much needed in spelling and accidence for the establishment of correct usage, and is invaluable as verification in science work. Second, since children lack many controlling ideas by which to systematize their observation, it is important to arouse their interest, direct their attention, suggest an aim or " goal-idea," and teach them the value and method of use of such ideas rather than proceeding in haphazard fashion. Third, as accuracy can be improved by training while the amount noted depends more directly on the age of the child, emphasis should be laid on attention and verification. Overquestioning on the memory of the material presented will not assist the quantity recalled very much; indeed, the high suggestibility of children makes this last a doubtful expedient at best.

All through childhood continual contact with things of all kinds is necessary. Consider the value of excursions, museums, factories, nature study, handwork, elementary science, duties about the home, in the school, on the street, which involve dealing with the World of Things. This should be followed by the testing of the perceptions acquired, at first under the direction of the teacher. Also situations must be arranged that encourage free, spontaneous observation on

the part of the child, first in one field and then in another. In all this training, it must be constantly borne in mind that there is no faculty of observation or perception that can be trained for usefulness by a course of arbitrarily arranged material. If observation of people is needed, training in that line must be given; if of nature, the training must be with that material; if of foodstuffs, or dress materials, or musical tones, or words, or qualities, or relationships, in each case the training must be definite and particular. Further, training the eye to perceive will not, cannot train the fingers; they must be trained, their power developed by their own activity. There is no mysterious transfer of power from one sense department to another. Every bit of development acquired comes as the result of some definite activity, and the fingers have been much neglected in the development of perception. The very fact that in childhood the sense of touch is most delicate should stir teachers to make the best use of it at that time, not only in handling objects, but in responding to texture and to pressure. The muscle sense which, combined as it often is with the tactual, gives the true feeling of a thing, also needs special training in the perception of form and contour. Nor need the sense of smell, decadent as it is, be neglected.

In connection with this matter of training, Dewey says, "No number of object lessons, got up *as* object lessons for the sake of giving information, can afford even the shadow of a substitute for acquaintance with the plants and animals of the farm and garden, acquired through actual living among them and caring for them. No training of sense organs in school, introduced for the sake of training, can begin to compete with the alertness and fullness of sense — life that comes through daily intimacy and interest in familiar occupations." [1] Hall emphasizes something of the same truth when he says, "The best preparation parents can give their children for good

[1] School and Society, p. 24.

school training, is to make them acquainted with natural objects, especially with the sights and sounds of the country." [1] Although the country offers the best opportunities to develop perceptions in connection with the natural world, yet the city, the great field of industry, of the result of man's labor and invention, offers measureless opportunities for development along different lines. No matter where the child is living, material is there, — living, vital material, to which the child is constantly reacting. It is the duty of the teacher to take these life situations, and in connection with the reactions which naturally take place to develop perceptions which are clear, correct, and adequate, to see to it that they are as numerous and rich as possible, and to supply material or motive when either is lacking; for upon the material gathered from sense perception will depend all future growth and development.

Exercises

1. Spend 15 minutes in each of three or four classrooms noting indications of defective vision or hearing among the children. Verify by consulting the teacher for names of the children suspected and by looking up such records as the school keeps of each child's physical condition.

2. Find out who has charge of examining children for sense defects, (1) in the rural districts nearest you, (2) for the high-school population.

3. Get specimens of the physical report cards used in the city or county where you live.

4. Have a short selection played on a victrola five or six times.
   Attend the first time to the melody.
   Attend the second time to the rhythm.
   Attend the third time to the quality of the sounds.
   Attend the fourth time to the alterations in tempo (if any) or extremes of pitch.
   Attend the fifth time to the harmony.
   Attend the sixth time to the thoughts or images suggested.

[1] The Contents of Children's Minds.

Notice how different your attention feels each time. In which case did you get the least result? Why? What does this suggest for teaching?

Questions for Discussion

1. How does the method used in the early teaching of Helen Keller, or of deaf-mutes, illustrate the growth of perception from sensation?
2. What is the difference in attention when one looks, looks at, or looks for? Or listens, listens to, listens for?
3. Illustrate effects of the law of "mind's set" during a sense presentation.
4. What is the fault in teaching as follows: giving fifth-grade children a map saying "Study that for next time"? Announcing that "I want you to listen while this is played and then tell me what you notice"?
5. Mention cases where touching and manipulating objects are of great assistance in helping correct perception.

References for Reading

Hall, *Aspects of Child Life and Education*, pp. 1–52.
Whipple, *Manual of Mental and Physical Tests*, ch. 8.
Meumann, *The Psychology of Learning*, ch. 4.
Terman, *The Hygiene of the School Child*, chs. 13, 14.

CHAPTER VIII

MEMORY

PHYSIOLOGICAL BASIS OF MEMORY. — The term "memory" has been used to refer to several different kinds of mental processes, but in its most general use it refers to the fact that a situation tends to evoke the mental response with which it has previously been connected. The original roots of this tendency are to be found in the modifiability of the synapses in the cortex. A connection once made leaves its mark on the synapses involved. The synapses concerned in memory, then, are those of the secondary connections. As was pointed out in Chapter V, the possession of these tendencies to secondary connections is one of the distinguishing marks of the human species, and the great modifiability and retentive power of the synapses produce in man a power of memory infinitely above that of the lower animals. Good and poor memories find their ultimate explanation in this plasticity of synapses. They are a result of the physiological structure, a gift of original nature, and although conditions hindering the best action and development of memory may be removed and be replaced by stimulating ones, still the original retentiveness remains unchanged. Memory, as a physiological quality of brain tissue, cannot be improved.

What is meant by "memory"?

IMMEDIATE MEMORY AND RETENTION. — To distinguish further between the different usages of the term, we may recall from general psychology that it may stand for (1) immediate memory, that is, the reproduction of material without any appreciable time interval between the impres-

sion and the expression; and (2) retention, indicating the power to reproduce material after a considerable interval, varying from hours to months, has elapsed. It is important to notice in which of the two senses the term "memory" is being used; for the development is quite unlike in the two abilities, as is also the difference between children and adults. Many authors use the expression "memorizing" when discussing immediate memory, since rote memorizing for laboratory purposes has usually been tested immediately. Naturally, for schoolroom purposes, a teacher's use of the same expression by no means coincides with the experimenter's idea of mere immediate reproduction.

Difference between children and adults. — Contrary to popular opinion, adults can memorize better than children can. Children fall far below adults in their power of immediate memory. All the experimental evidence goes to show that there is a gradual improvement in this power up to about fourteen or fifteen years of age. After that period memory fluctuates. Some investigators, Meumann in particular, claim that improvement goes on, though unsteadily, up to about twenty-two, with a rapid gain in the early teens, whereas many others find but slight improvement after fourteen. A few psychologists, G. Stanley Hall in particular, find that the age from ten to twelve or thirteen is the opportune time for memory development; the majority agree on no one period as better than any other.

How do adults and children differ?

The facts concerning permanent memory tend to bear out the common impression that children have better memories than adults. It is probable that what on the ground of theory one would suppose to be true, is really true; namely that the retentive power of children is greater than that of adults. Although retentiveness is weak during the first four years it improves steadily up to about twelve years old or perhaps slightly later; after that, both ability and ac-

curacy in retention fall off. So that although children forget more than adults do, as is proved by the conditions of immediate memory, the material that survives the process of obliviscence is retained longer than the same material by the adult. Combining the facts of immediate memory and retention, then, a child of ten would not learn so easily as an adult of thirty for an immediate test of memory, would forget more during the first twenty minutes following the memorizing, but would keep better to the next day or next week whatever survived this first forgetting period. Whatever may be the factors that account for this difference, greater interest, greater plasticity, fewer mental processes going on, or fewer facts already fixed in memory, the fact still remains that what one gets in childhood is more likely to remain than what is fixed at any other time in life. In old age, or sickness, it is the more lately acquired associations of maturity which are the first to fade or become inaccurate; those made in childhood persist. The recent work of the Freudian school tends to emphasize this fact, though rather from the point of view of the force of early impressions tinged with any emotion or excitement.

Suggestions for teaching. — The practical suggestions arising from these facts are self-evident. If connections, associations are worth while, childhood is the time to fix them. Later in life they can be fixed only at the expenditure of much unnecessary time and labor, and sometimes even that will not suffice. Our forefathers were right in theory, although the material chosen may have been faulty, when they insisted on children's memorizing poetry, speeches, maxims, and passages from the Bible. If such material is worth having in memory, the time for getting it is before puberty. On the other hand, the fact that immediate memory is comparatively poor in childhood makes it imperative that measures be taken to insure the retention of the material beyond the most active period of obliviscence. The value of "overlearning" for purposes of recall needs to be impressed on teachers and

students. To be able to repeat a thing once without error, though it may satisfy a laboratory requirement, does not argue a memory of it in the sense of probable accurate retention. The correctness may be a matter of chance as every learner discovers when "trying once more." Consequently, children should be encouraged to learn till they can repeat material at least twice running without error, which will entail a much greater number of repetitions and efforts to recall.

MEMORY FOR VARIED MATERIAL. — Memory for different types of material has been described, emphasized, and tested by Binet, Meumann, Netschajeff, Lobsien, Pohlmann, and others. Unfortunately the nomenclature is apt to be confusing — for instance: auditory impressions were given of a series of different sorts of sounds, such as clapping, whistling, stamping; or of words meaning sounds, such as music, song; or digits were spoken rather than presented in series to the eye, and any one of these things may be meant when speaking of "auditory memory." However, there is no guarantee that material presented to any one sense organ is remembered in corresponding imagery, so that "memory for auditory presentations" would be a more accurate way of expressing the facts. Moreover, to write a description of a sound heard, as in the first series described above, is not the same sort of thing as making a similar series of sounds one's self, as is demanded in a music test, nor is it so simple as writing down a series of numerals heard rather than seen.

Ages of development. — With these precautions in mind we may accept the findings of Smedley [1] that auditory memory develops rapidly up to about 14 years of age and but slowly afterwards, while visual memory seems to develop up to about 15 or 16 years of age. Before 9, auditory memory is stronger than visual. Though on the whole there is general improvement up to the teens, yet the rate for different forms of

When do the different types of memory develop?

[1] Report, Dept. of Child-study (Chicago Public Schools). No. 3.

memory is not the same, nor do the maximum periods for all coincide. Netschajeff [1] and Lobsien agree in pointing out periods of rapid improvement in some forms of memory followed by periods of lack of improvement. Before twelve years old concrete words are better remembered than are abstract terms, and, as might be expected, memory for objects seen is better, and develops earlier, than memory for words or numbers. The years ten to twelve are specially favorable, the period fourteen to fifteen specially unfavorable for development. Girls are better than boys during the ages eleven to fourteen, and usually reproduce more of the material, though with less accuracy in the order, than boys. Other sex differences are as follows: "With boys the memory for objects is first developed, then words of visual content, words of auditory content, sounds, terms denoting tactual and motor experiences, numbers, abstract conceptions, and, lastly, emotional terms; with girls, the order is words of visual content, objects, sounds, numbers, abstract conceptions, words of auditory content, terms denoting tactual and motor experiences, and emotional terms." [2]

It should be noted that children's memory for a series of words denoting emotions, such as joy, sorrow, hope, care, is poor. Naturally, to them this is a series of abstract terms more remote from their normal vocabulary than the corresponding adjectives would be. It is not surprising, therefore, considering the late development of memory of abstract terms, that children should do poorly with lists of this type. What is really amazing is that the investigators, on such a foundation, should have based a statement that children below fourteen possess a very poor memory for emotions. If we could induce a series of actual emotions in the children, or arouse them even in imagination, testing by normal bodily expression or "acting out," we should probably find a very

[1] Zeitschrift für Psychologie, 24 and 27.
[2] Rusk, Introduction to Experimental Education, p. 82.

different state of affairs. Certainly children's emotions are keen enough, and this very intensity serves to recall experiences after long periods of time; but we need a more refined test before accepting at face value any conclusion such as that stated above, and so frequently quoted.

Teaching suggestions. — Two factors which condition the recall of a fact are the depth of the impression, and the number of associations or cues which it has. When memory depends primarily on the first factor it is likely to be of the desultory type, whereas an emphasis on the second factor results in logical memory. The adult's tends to be of the logical type, while that of children is more of the desultory type. The memory for related ideas improves steadily up to thirteen or fourteen, so that a larger proportion of the associations in the child's mind is of the desultory sort than in the adult's mind. It seems almost impossible for an adult to hold in memory a fact when there is not much to hang it to, no relationships or reasons that will serve as cues, whereas such facts seem simply "to stick" in the minds of most children. This being true, it behooves the educator to take advantage of this tendency and to fix in children's minds certain more or less isolated facts, such as modern language vocabularies, equivalents in mathematics, names in geography, symbols in chemistry and physics and spelling. Wessely affirms that "vocabularies (Latin-German) are reproduced more accurately at the expiration of one to four weeks when learned by twelve-year-old, than when learned by fifteen-year-old S's."[1] This is a strong argument for beginning modern languages in the grammar grades; and when one realizes that it is from ten to twelve that children become so very much interested in secret languages, dog Latin, etc., the motive for such work is supported. As this type depends primarily on the depth of the impression for the power of recall, it is necessary that the impression be made as intense

[1] Summarized by Whipple, Manual of Mental and Physical Tests, p. 376.

as possible by use of appeals to native attention and instinctive interests. On the other hand, the fact that logical memory develops with age, being a secondary form, offers many opportunities for training. There is no question that logical memory is the more efficient type in the long run, although desultory memory is of value to all people sometimes, and for certain professions is an absolute necessity. The development and training of logical memory is one of the means of developing children's thinking power, and from another point of view it is an essential element in all thinking.

RELATION OF RATE OF LEARNING TO RETENTION. — It has been customary for teachers to regard with suspicion the child who learns his lesson in very much less time than the rest of the class need. The maxim "Easy come, easy go" has been firmly fixed with respect to memory work. Recent experiments with both children and adults as subjects prove conclusively that the quick learner is not the quick forgetter. Children who learn quickly retain more on the average than those who learn slowly, both as tested by immediate and permanent memory. It is very important that all those dealing with children bear this fact in mind. The quick learner, whose work is looked upon with suspicion, and who is sent back to it again and again, is not only developing an emotional attitude of dislike or indifference for the subject and sometimes even for the school, but he is forming bad habits of work. He is learning not to put his best work into his study, not to work at his highest speed, because it "doesn't pay." He forms habits of half-hearted work of divided attention, and the teacher is to blame. Many children of bright minds and quick memories may thus have been almost ruined for their best work, just because their ability was not given full rating, was not accepted at face value. Of course, all children have to be taught to test themselves when they are studying, and to know when they do know the lesson,

Is it advantageous to learn quickly?

and not to stop just short of the threshold of recall but rather to go a little beyond. All children need this training, but the quick learner does not need it any more than the slow learner. There is a crying need in school for a recognition of this kind of ability and provision for it. More individual instruction, less formality in school programs, will be demanded, more variety in material offered; but such changes are essential to the development and saving of the quickest minds.

MEMORIZING. Distributed or continuous method. — The value of distributed, rather than continuous periods of learning is obviously important in the case of young children, because of the characteristics of their attention. The younger the children the greater should be the number of brief periods. For primary children it is certainly better to have a subject twice a day, than to concentrate the same number of minutes into one period. For grammar-grade children it is better to have a subject for a shorter time every day than to have three long periods a week. For high-school students, a double period once a week is an uneconomical allotment of time. Not only do the characteristics of attention involving interest and fatigue make this distribution advisable, but the fact that with impressions of equal strength those formed earlier are less adversely affected by time adds another reason. Besides this value of the aging of associations and the extra opportunities for recall, the facts of repetition and correlation suggest that a month's short, intensive course, not followed by a related course, is little likely to produce good results. The twenty or more crowded lessons, isolated from other similar material, would be better remembered if spread over a longer period with more opportunities for cross-associations, wider range of relationships, and recall at longer intervals. At the other extreme of undesirability is the course of forty lessons spread over an entire school year, with a large fraction of each period, and therefore of the total teaching time,

By what method shall we adjust time in learning?

spent on renewing contact with the subject matter, " warming up" as it is called. However, it must be borne in mind that both the character of the minds taught and the character of the material must determine the length and frequency of learning periods. Too long periods may induce a lack of attention if there is monotony in dealing with mechanical processes or material very nearly mastered, or they will involve fatigue with young children; too brief periods may not allow for orientation in meaningful or new material, nor for those children who warm up slowly. Too frequent periods may prevent logical synthesis and may train in cramming methods; too infrequent periods may result in dissipated interest and effort and in shaky habit formation. As to the intervals between the periods, experiment shows that these should be small at first when dealing with new phases of subject matter, and should gradually lengthen as the periods themselves perhaps decrease in length. Thus, a new topic may occupy the whole of Monday's lesson-period, two thirds of Tuesday's, one half of Wednesday's, one third of Friday's, take one fourth the time the next Monday, be briefly reviewed the following Thursday or Friday.

Why are short breaks between classes desirable?

The facts of retroactive inhibition are of especial value in their application to children. In all learning the activity of the neurones concerned goes on for some minutes after the mind has ceased to engage itself with that particular subject. This activity tends to give added strength to the connections, and material imperfect when it is left gains in perfection by just this physiological activity. Any other mental activity occurring immediately interferes, of course, with this " setting " of the associations and therefore weakens them. The greater the likeness between the two types of activity the greater the interference. In addition to this general fact, the peculiar strength of mind's set in children, the difficulty they have in breaking away from a train of thought, makes

the need for an intermission between periods of mental work almost imperative. In the upper grammar grades and in the high school, where there is departmental work, this need is met by the passing from room to room, but the younger children need such a break even more. When a period of mental work is followed by one where handwork predominates, or singing, or physical exercise, the interference is comparatively slight. Even in this case, the attention may still be actively directed and physical movement largely inhibited. The best plan with young children is to have a distinct break of some kind, an intermission of five or six minutes between periods where from the character of the work involved, time is necessary for this "setting." This practice will facilitate memory.

Repetition, concentration, or recall. — Given something to learn, it is natural for the child to adopt the method of repetition in order to fix it. He will repeat the material over and over again mechanically, but it is probable that his attention is on something else after the first few repetitions. This state of affairs obviously results in waste of time and energy, also the lesson often remains unlearned, and bad habits of study are being formed. And yet, this is the natural method; on the surface the easiest. Telling a child to "concentrate his attention" has little or no effect. Some motive must be supplied, for it is essential that children from the beginning learn to work while they work. There is no royal road to the accomplishment of this end, — so much depends on the individual child; the teacher's ingenuity must find the best means of appeal. To limit the number of repetitions allowed for the memorization of the poem or the spelling lesson, or to limit the amount of time which may be put on a given lesson, are incentives to concentration, and of course an appeal to the instinct of rivalry always brings results. No matter what the means used, children must be taught to abandon the poorer method in favor of the better.

How should attention be adjusted?

In many cases, even repetition with concentration is not efficient as a method of learning. In much of the school work the object is to get the meaning of the material, and not to learn it by rote. This method of repetition and concentration emphasizes only serial connections; there is no opportunity to break the material up into meaning units, no encouragement to form cross-associations. The connections being formed are not those that will be used when the material is called for. For example, in studying history, a boy is making connections between the sensory neurones of his eyes, and certain associative neurones aroused by paragraph after paragraph as he reads. But in actual classroom work, the stimulus will probably be auditory — some question by the teacher — which will require a breaking across of all the serial connections formed and the selecting of one small fact, or relationship. If in his study, the boy has prepared for nothing of the kind, his answer will come with hesitation or perhaps he will "know it but not be able to say it." He has not formed connections in the way in which they will be used. The same thing holds when the stimulus is some life situation, and the child must recall from within the answer, with no sense cue, and no series of related associations as aids. It is necessary, therefore, that children be taught how to memorize, and how to learn. Not only must they learn to concentrate, but in their study they must form the habits of recalling from within, of asking themselves questions on the lesson, of breaking the material up. There are various aids that a teacher may use to encourage such a method of study. A common one is the assigning of topics in connection with which the material is to be learned. Asking the children to find answers to certain questions, to frame questions on the text, to make topics, to pick out the most important sentences or facts or words, — all these prevent study by mere repetition. Even when it is rote memory, experiments have shown better results when the study involved recall from within as well as repetition and concentration.

Whole or part method. — Laboratory experiments have shown that the whole method of learning is better than the part method in rote memory work, that for instance, better results are obtained in memorizing a poem if it is studied as a whole instead of stanza by stanza. General psychology makes clear the reasons for this result, and because of these reasons we should expect the whole method to be the better for children. In actual school practice, however, serious difficulties have been met with in the application of the method. Colvin sums them up under three heads.[1] In the first place, children are discouraged because when they spend a given period of study on a selection as a whole, at the close of it none of the selection is above the memory threshold, they seem to have accomplished nothing. In the second place, some parts of the material are more difficult to learn than others, and therefore it may be that many repetitions of the whole memory material are needed for the sake of these few difficult passages. In the third place, it is rather hard to practice recall when the whole method is used. The younger the children the more serious these difficulties become, but they are not insurmountable. If the length of the selection to be memorized is adapted to the age of the children, and they are warned of the first difficulty and incited to work so hard that at the end of the second or third period of study they will know most of the selection, discouragement then will not be serious enough to be a hindrance. Because of the second difficulty, it has been found advisable to adopt a combination of the whole and part methods. When by the whole method, the selection has been well enough learned for the difficult parts to stand out, these may be mastered by the part method, and a return made to the whole method for a completion of the learning. So far as the third difficulty is concerned, the only thing to do is to encourage recall by all possible methods.

By what method shall we adjust the amount to be learned?

[1] Colvin, The Learning Process, p. 161.

Colvin summarizes a compromise method thus: "Select material of reasonable length for one period of study; go over it carefully and slowly for purposes of orientation; repeat this until the general nature of the material is clearly understood, then increase the tempo. Continue to learn by the whole method until the majority of the material is raised above the threshold of memory. Next, strengthen the weak associations; . . . then go over the whole again till it is fixed. It is desirable to raise all the elements considerably beyond the threshold of memory. During the learning period practice recall; also, allow several minutes after the actual learning is finished for recalling and fixing the associations already formed. . . . Relearn the material on several succeeding days." [1]

Variation in sense appeal. — Smedley and Pohlmann [2] have investigated the type of presentation most effective in memory work with children; they agree that combined appeal is more powerful than appeal through any one sense. The order is probably auditory-visual-articulatory; auditory-visual; auditory-visual-hand-motor; visual or auditory (depending on the age). From these results it is evident that writing is not always an aid to memorizing. Colvin thinks that it is a hindrance up to the sixth grade. After that, the act of writing has become mechanical, and it will probably serve as an aid. The method of having children in the lower grades write their tables or the poem, or the facts in geography as a help to memorization is probably wasteful; but to hear, see, and say the material is the best means of impressing it.

What other aids to memory exist?

It has been found that rhythm is an aid in learning; with young children the interest in rhythm and the tendency to respond in rhythmic terms are instinctive, and therefore strong. Not nearly enough use has been made of this original tendency. The energy here, the interest already provided by the

[1] Colvin, The Learning Process, p. 175. [2] Zeitschrift für Psychologie, 44.

child's nature, has been proved an aid; and yet teachers in general neglect it, and use artificial devices to catch the attention and insure the fixing of facts.

OTHER FACTS INFLUENCING MEMORY. — These general characteristics of the memory of children have been shown in interesting and concrete form in the study of testimony and report, which has attracted so much attention in recent years. The lack of capacity which children show in these lines is caused not only by their defects of memory, but also by the inaccuracies of attention and perception which have already been discussed, by the inadequate action of their imaginations, and by the fact that they do not tend to put into words what they observe. Whipple in summing up the various experimental results says, "The reports of children are in every way inferior to those of adults; the range is small, the inaccuracy large, and, since the assurance is high, the warranted assurance and reliability of assurance are both very low. During the ages 7 to 18 years, the range, especially the range of knowledge, increases as much as 50 per cent, but the accuracy, save in the deposition, does not increase as rapidly (20 per cent). This development of capacity to report is not continuous, but is characterized by rapid modification at the age of puberty. The one factor that more than any other is responsible for the poor reports of children is their excessive suggestibility, especially in the years before puberty."[1] Inaccuracy increases with the length of time elapsing between the occurrence and the reporting, and with the number of times the incident has been described. It is also true that a report may be absolutely inaccurate in some of its details and accurate in others.

What makes for inaccuracy in memory?

These facts are of practical value in dealing with children in connection with school situations. Both teachers and parents must recognize that with the best of intentions, chil-

[1] *Op. cit.*, p. 306.

dren's reports of what happens in the school, on the playground, and on the streets, cannot be accepted at their face value, — and the younger the child the more this is true. Much of the trouble arising between parents and school authorities could be avoided, if they both could be convinced of these facts. It should also be borne in mind that the child is often not conscious of falsification, is not lying in any sense of the term. Such inaccuracies must occur under certain conditions because of the incomplete mental development. The parents and teachers themselves gave such inadequate and false reports in childhood. The danger of using questions with young children to get at the truth of an occurrence is also made clear by these investigations. Every question contains a suggestion; and before puberty, when the children are so suggestible, it is almost impossible for them to withstand the force of the suggestion offered. This is true not only when occurrences requiring discipline are subjected to questioning, but when the doings of the child or his family, excursions, visits to museums and art galleries, or even the material in a textbook, are asked about. Of course, this does not mean that questions should never be used; but it does mean that the questions should be most carefully framed, and that some other means should be resorted to as well, in order to make sure of the truth or accuracy of the reports.

PRESENT STATUS OF MEMORY WORK IN SCHOOL. — At the present time, memory work in the school is at a discount. In many quarters it is considered "old fashioned," and "unpedagogical" to require children to memorize, and the work of children in the higher grades and in the high school is suffering from just this lack of a foundation of essentials in terms of memory. Memory is necessary in all learning, as has already been pointed out; it is also indispensable in constructive imagination and thinking of all grades. With sense perception it forms the foundation upon which

Should children be required to memorize?

all advanced mental work of a more complex and inventive nature must build. Incompleteness or inaccuracy in either of these fundamental factors results in serious difficulties later.

The discredit and contumely which is being heaped upon memory is due largely to two causes, a realization of its limitations, and a reaction against the dead, formal methods that used to be employed. There is no doubt that the memory training of the past fell short in both of these directions. Mere memory work even of the logical type will not prepare a child to meet efficiently life situations; but because this fact is true, to go to the other extreme, and require little or no memorization is absurd — it makes impossible the realization of the very aim in favor of which memory work has been discarded. Present-day education, in its desire for independence of thought, originality of belief, and freedom of conduct, is in danger of inducing a foolish lack of dependence on facts, a cheerful belief in pseudo-originality which ignores the achievements of the past, and erratic conduct free from coördination by verification, and from automatic regulation. We are almost afraid of the word " drill "; to that extent are we open to the criticisms of some of the materialists of our world, that the schools simply " amuse " the children. Facts, as well as habits of all kinds, must be present in the child's mind if he is to make any progress in independent work, and this is only accomplished by memorizing, and often by drill. This does not mean that the kind of memory appealed to, the material that has been selected for memorization, or the methods used have been of the best, or that they should be adopted.

Changes in all three of these directions are needed in accord with experimental and child psychology. Logical and desultory memory need to be assigned their proper spheres, and memory of meanings and relationships should receive recognition as well as rote memory. The material must be

chosen in the light of the results of the transfer of training, and of the present needs of the child as well as the ultimate aim of education; the methods used must take into account the relation between memory and thinking, and the instincts and interests of children of various ages. Above all they need to have aroused in them a desire to improve in various kinds of memory, and to be given standards by means of which such improvement is to be judged. The inadequacies and inaccuracies of children's memories have been shown all through this chapter, and what they need is not less memory training, but more of a different, and more effective kind.

Questions for Discussion

1. Given a musical composition memorized in childhood, one in the teens, one in the early twenties, which is likely to be most easily revived in the thirties? Why?

2. Supposing the methods taken to memorize were equally good in each case, who would take longer (or require more repetitions), a nine-year-old or an adult, to fixate: (*a*) the spelling of a word in a foreign language, (*b*) a piece of music, (*c*) a prose paragraph of interest? Why?

3. Of a class of twenty-six fifth-grade children, after looking at a list of words during ten minutes that they were visible on the blackboard, writing each twice, hearing each pronounced and spelled anywhere from 7 to 15 times, nine made one or more errors during a written test. What does this suggest as to (*a*) any risk of overlearning? (*b*) probable difference with twenty-six adults? (*c*) methods of memorizing spelling?

4. What facts from the psychology of children's memories explain why grammar is a difficult study for most of them?

5. Suggest several reasons for the ability of some people to memorize quickly.

6. What are the advantages and disadvantages of "six weeks in astronomy" for a first-year high-school science course?

7. Illustrate the use of rhythm in helping to fix facts for children.

8. Illustrate the method of recall in connection with memorizing
   (*a*) a foreign vocabulary,
   (*b*) a piece of prose,
   (*c*) formulæ in trigonometry, algebra, or chemistry,
   (*d*) the substance of a dozen pages of a history textbook.

References for Reading

Colvin, *The Learning Process*, ch. 11.
Rusk, *Introduction to Experimental Education*, ch. 7.
Whipple, *Manual of Mental and Physical Tests*, pp. 356–403.

CHAPTER IX

IMAGINATION

ORIGINAL BASIS OF IMAGINATION. — The original roots of imagination are to be found in the wealth of fineness of organization of secondary connections, although richness of the perceptual associations is necessary as a foundation. Free mental images depend, primarily, on the development of percepts, and these in turn upon the interaction of the various sense departments with their immediate association-connections. The secondary connections allow for the recall of the percept in some of its associative setting from within, and this is reproductive imagination, or the memory image. This is probably as far as animals ever get in their imaginings, and, even on this level, being deficient both in wealth and activity of secondary connections, they are far below man. Productive imagination depends upon the fact that because of this fineness of organization, because of the multitude of neurones involved in any and every mental state, the action may be concerned with elements and parts, and not with the state as a whole. Because of this "hair trigger" organization one element in a situation may break away from the others and build up its own content, giving a constructive image or images of the imagination. One other factor of original nature enters, and that is the satisfyingness of the activity of these secondary connections. The power of mental control is in itself a pleasure; and the mere flow of images, coming spontaneously as they often do, is a satisfaction. Given the nervous equipment necessary for numerous clear percepts, the power of imagination of any kind depends

primarily on the type of the organization among these higher centers; a defect in wealth of connections, or in delicacy of connections, or in the satisfyingness of activity on this level will result in a limited power of imagination. So far as the possibility of training goes, there is a wide field for endeavor in stimulating and directing; but, as in the case of memory, a fertile or vivid imagination is a function of the nervous system.

DIFFERENCES BETWEEN CHILDREN AND ADULTS. — The difference between adults and children in imagination may be discussed under three heads: differences in kind of images, differences in vividness of images, and differences in number of images.

How do children differ from adults in the kind of images they have?

In kind of images used. *Children visualize more.* — It is probable that in childhood the proportion of visual images is greater than at any other time. This fact, however, which used to be considered of great practical importance, is of little value, and this for two reasons: first, experimental psychology has shown that the type of image depends not on the individual, but on the material, on the extent to which purpose is involved, and on the presence of difficulties. An individual cannot be classed as being of the visual type, for instance, for the reason that though when imagining people he may visualize, when his images deal with words they may be auditory-motor, when flowers are the subject they may be olfactory. Likewise, though in passive imagery the visual type may predominate, in active imagery some other type may take the lead. The old idea that people are divided rather distinctly into " types " is being replaced by the opinion that individuals of a fixed type are rare, whereas those of the mixed type are the most frequent. This is as true of children as it is of adults, even though the greater proportion of visual images in childhood remains a fact.

The second reason for the change of attitude regarding the importance of imaginative types is found in the fact that

the sense department through which the material is received, and that in terms of which it is recalled, need not be the same. Thus one may depend on one's eyes for the clearest, most effective percepts, and yet in recalling the situation use auditory images, as in memorizing music. Or one may listen to a description given orally, construct visual images to illustrate it, and recall in terms of those same visual images. Or one may learn by making movements, as in dancing or producing a certain speaking or singing tone when visual and auditory percepts play a secondary part, and the imagery may be almost entirely lacking so far as terms of recall are concerned. The old advice to the teacher, to discover what type of imagery a child used in his thinking, was given in order that she might present perceptual stimuli in corresponding terms; but since the percept and image need not so correspond, the reason for the advice does not hold. She no longer must present visual stimuli for those who use visual images, nor auditory percepts for those who use auditory imagery, and so on. What is important, however, is that a sufficient number of varied perceptual appeals be made, with strict attention on the part of the learner, so that the memory may be good and the response accurate. So far as the imagery is concerned it may be present or not, be vivid more or less, may correspond with or differ from the percept in kind; it makes very little difference so long as the results reached by the child are correct. The presence of one or another type may be of interest in theoretical psychology, but has no practical bearing on the kind of perceptual presentation used by the teacher for a whole class. Occasionally the tendency to a mistake may be traced to the form of imagery a child has employed; for instance, a spelling confusion such as " proceed " with " precede " is probably due to a lack of visual imagery, and a contraction such as " adaption " for " adaptation " to a lack of auditory imagery.

Children use concrete imagery more. — Another difference between children and adults, one which is of much more

importance, is that between the object and word type of imagery. Experiments seem to prove that children tend to think in terms of objects, whereas adults are more inclined to use words. To a child the thought of a tree or a house or a book is a picture of the object; the thought of the Pilgrims' Chorus or E-flat is the melody or the note. To an adult, the thought of any of these is more likely to occur in terms of words, — the actual object itself not appearing in consciousness. The value of the verbal images as opposed to the object images from the standpoint of economy of time and energy, of definiteness and accuracy, and of retention, has been demonstrated in all fields. Of course, it is the only type of image available in dealing with abstract subjects; and its efficiency in constructive work, even in the arts and literature, has been testified to by workers in each of these fields.

Do adults or children use more verbal imagery?

Training in verbal imagery. — It would seem, then, the business of teachers to replace the less effectual object-image of children by the much more useful word-image. But teachers are prone to object to hurrying this process on the ground that the object-image is necessarily fundamental, and there is danger that the children will get words without content. In the first place, it has yet to be proved that the object-image is necessarily fundamental; *e.g.* smell and temperature images are notably rare; in the second place, the word-image should get its content not from the inaccurate, unreliable object-image, but from direct perceptual experience. The word " horse " in a child's thought has meaning in proportion as it has been directly connected with sensory experiences of the object, not through the mediation of an object-image of the animal. To use object images only is the mark of an immature mind. They may add a richness of color in certain fields of appreciation, and there they should be called into play; but in the field of thought they should be replaced as quickly as possible by verbal images. This

practice would mean two things: a broadening of sense experience and a direct connection of words with it, and more extended and definite training in thinking in terms of language. Children's ability to think is conditioned by their power to use verbal images, and, as we have seen, this power comes slowly. Age helps, but training can do much to give meaning to the word images, increase the thinking vocabulary, and give control to the manipulation of these images.

In connection with the extended use by adults of words and symbols for all sorts of concrete experiences of varying degrees of complexity and richness, has arisen the question as to whether the mind in its thinking does not go one step further, and think without using images, at least without using anything that could be classed under the usual term " image." This controversy over " imageless thought " has aroused hot discussions, and no one opinion has been accepted by large numbers. However, from the standpoint of child psychology the dispute offers some practical suggestions. The well-trained mind not only replaces object by verbal images, but gets on with a minimum of these. Kinæsthetic forms, such as a mental gesture with the hands, or a lifting of the eyebrows may convey meanings such as clarification or doubtful hesitancy. Even without these, the feeling of being attracted to, or repelled from a certain course of action or line of thought, with mere fleeting snatches of phrases, may be found to play a large part in logical thinking.

Now this sort of thinking is worth while for the same reason that the word-image is more worth while than the object-image; *i.e.* it is economical. If so, it is the teacher's duty to develop more of this type of wordless thinking in children. An analogous type of training is done in connection with perception, when one characteristic is enough to arouse the full percept, and when children are asked to " skim " a paragraph or a book, and get the meaning. They are asked by the help of a few of the important words, a feel-

ing of the drift of the paragraph, to get the essentials without wasting the time to get a clear percept of all the words. In thinking we need more of the same kind of training, and it can be done only by limiting the time allowed and insisting on some kind of answer. To give children several alternatives and demand a choice with reasons almost immediately forces them, simply by the exigencies of the case, to do thinking of the type we have been considering. With the facts in hand in history, to prophesy what the ruler, or the congress, or the inventor did, without being given time to work out the details reduces the verbal images used to mere schema. In arithmetic, the plan followed by good teachers of asking the children to estimate or "guess" the answer to the problem before solving it gives training along this same line. This is not the place to discuss the value of this method from the standpoint of training children to think; but any thoughtful person must realize that not only are the children getting training in the use of efficient tools, but in the process of thinking also. Of course, in all this process, care must be taken that it is true thinking, and not "guessing" in the ordinary use of the term that is taking place. If, however, children are required to abide by the choice they have made, or to find out what did actually happen, or to check up the correct answer with their prophecy, and then be asked for a criticism of this forecast, the work will be placed on a safe basis, and random, unsupported guessing will be abandoned.

Characteristics of different periods. — A comparison between adults and children as to the difference between them in reproductive and productive imagery does not give such definite conclusions. Without doubt, the reproductive is the fundamental and earlier type. There is little possibility that children under three can use any but this kind, and even after that age the plays of the kindergarten and primary school child are largely reproductive and imitative. However, from about three to

How does imagination change with age?

seven or eight there are definite evidences of creative imagination. It is characterized by the fairy-tale element, its disregard of the possible. It is fantastic, and the flights of fancy in which children of this age indulge are comparable only to the night dreams of adults. As they grow older, between ten and thirteen perhaps, most children become more matter of fact. Their productive imagery loses its fanciful characteristics and becomes more bound by the laws of the possible. The imagery of children of this age is more practical, of value as it accomplishes results; it still has a large share in their plays, but it tends to be more purposeful. It is objective rather than subjective, realistic rather than fanciful. During adolescence, a new element is added in the intensity of the emotional life of that period. The imagery now takes on many of the characteristics of the first period, though the content of the imagery is different; it is no longer of the fairy-tale type, but has to do with the youths' and maidens' own doings, ambitions, accomplishments, and plans. It is highly subjective, for the adolescents always hold the center of the stage in their dreams. The element of fancy, and the joy in the imagery for its own sake make it like the early period rather than the intermediate one, but it may be termed idealistic, since persons and human relationships are of prime concern rather than mere miraculous occurrences. This is preëminently the age for daydreaming. True, it appears earlier, especially with sensitive, lonely children, but at this age almost all indulge in it. Dr. Smith's investigation in the "Psychology of Day-Dreams" emphasizes the frequency and the absorbing power of this type of mental life. As the period of adolescence passes, the swing of the pendulum is again away from the fanciful, emotional type of imagination to the practical. The adolescent type now passes altogether with most people, though some individuals never grow away from it at all; yet the average adult is so pressed upon by the demands of a practical world that his

imagery, to fill his need, must measure up to the requirements of life.

VALUE OF PRODUCTIVE IMAGERY. — No more need be said at this time of the value of the reproductive image. It is fundamental, and its function has already been discussed in connection with memory. The productive type, however, offers a new element of the utmost importance. By means of it one is able to invent marvels in machinery, or aëroplanes, or costumes; one may revolutionize the world of philosophy, or find the cure for all social ills; one may control the forces of nature or convert nations, — one creates new worlds. All thinking, all invention, all progress depends on this power of reconstructing the old into a new thing. It is then one of the most precious abilities of the human race, and should be developed and fostered by all the means at the command of education. Upon the wealth and fertility of the imaginative power man must depend for all the suggestions that will make this world other than it is.

Is productive imagery intrinsically valuable?

One of the greatest dangers of the present customs in education is that this constructive and creative imagination will be killed by the pressure brought to bear in the demand for the reproductive. If it is to reach its highest development, it must be given opportunity to develop and material to feed upon, it must be stimulated and directed just as is any other faculty. The policy of ignoring it or repressing it will not produce fruitful results. In the period from four to eight, the stories, fairy tales, and myths offer material for children's creative imagination to work on. They fill a very definite need of children's nature at this time, and should certainly be given them. The lack of knowledge of physical laws and of the ways of the world, and the tendency towards animism make the material offered by the myth and fairy tale not only acceptable, but necessary for a full growth.

What fields offer training for productive imagination?

At no other time in life will this material be as vital or as satisfying as at this period. The dangers of overindulging the fancy will largely be corrected by the training in sense perception and observation that comes at this time. Not only should they be given the material to feed the imagination, but the tendency to construct which is present should be made use of. Children of seven or eight are very willing to tell stories drawn from their imaginations, and this willingness should be encouraged. Not only is opportunity offered to develop productive thinking in the realm of fancy, but the opportunities for the training in the use of words and real language in general are great.

During the next few years, when in school the emphasis is being laid on facts, when children in their own development are passing through a period of readjustment, when memory power is almost at its maximum and the suggestibility is less than before, it comes about that the fanciful element is replaced by a more practical one. This is the time to encourage constructive imagination in connection with handwork projects, or geography; here is the opportunity to teach simple geometry, art structure, and physics. Children are willing now to plan and then test their plans by putting them into execution. Earlier, they had neither the power nor the patience; later their imaginings are of such a character that this sort of thing is almost impossible. Their reading should be wide enough to include many models for their continued dramatic play. Children of ten to twelve who do not have such material as the tale of Robin Hood, Ivanhoe, the Arthurian legends, experiences of pioneers and explorers, ballads and all sorts of historical adventures and scenes to draw from as well as the glories of the circus, the mysteries of the ghost tale, the interests of the simple industries around them, are much to be pitied.

Possible dangers in adolescent period. — The period of adolescence is the most critical in its possibilities and, at

the same time, the most difficult to handle. The imaginings of adolescents are more absorbing, take more thought and energy than at any other time, and may become more vivid to them than the real environment in which they are living. The importance of getting the practical, constructive imagination started well in the period just preceding is partly due to the fact that now it may continue to be used to drain off some of the energy which might be used in morbid lines. Kept healthy by plenty of outside interests, physical exercise, companionship, and the satisfying of questions that the physical development of the period must bring into the foreground of consciousness, the imagination of this time is the motive force of ideals, is the root of appreciation of the beautiful in art, music, and literature. But it is also true that because of the strength of the sex instinct, there is a tendency for it to be directed into morbid channels instead of developing along healthful lines. "As a man thinketh, so is he" is never more true than at this period. Imagination allowed to run riot in unknown or forbidden channels first stimulates desire, and later incites to action. It is all-important here, as earlier, that the material upon which the imagination feeds should be wholesome and suitable. The books read in the teens are an immeasurable force in directing the imagination. It is useless and wasteful to try to starve it out by giving only material of scientific character. Adolescents should have romance, love stories, adventure, stories of reconstruction, and poetry, but they should all be good, — good not from the standpoint of the need of the adult, but from the standpoint of the need of the adolescent. The danger in this age of leading two lives, the outside one with which parents and teachers are acquainted, and a very different inside one, — not necessarily bad, but egotistic, emotional, and imaginative, — is increased by the sensitiveness of adolescents, and their fear of being laughed at if they give the keys of this inner life to any adult. In the sympathy

and understanding of a wise adult, however, lies safety for the development of the unstable, intense, imaginative, emotional life of the teens. Once inside the doors of this reserve, the power of the trusted adult to mold and direct is almost limitless. So very little is on record of the imaginative life of this period that the sympathetic approach must be largely an individual matter. The aim must be to keep alive in adolescents the belief in their own power, while shifting the limelight from their own doings to that of others; to take the imaginings from the field of fancy and build them into ideals; to bring about a balance between the inside life and the life of conduct; and at the same time to retain much of the fertility and power of the imagination for use in the play-time of maturity.

Differences in vividness of imagery. *Resulting confusions.* — Not only do children and adults differ in the kind of imagery which they use, but also in the vividness of that imagery. The images of children tend to be more vivid, more intense, than those of adults. So true is this that there is a time in the mental life of little children when it is difficult, and sometimes impossible for them to distinguish between memory images and the images of imagination. In some children the confusion goes even further, and they cannot distinguish between percepts and images. The possibility of this latter confusion has been very hard for adults to believe, but since the experiments on imagination made under Titchener's direction when adults mistook percepts for images, more credence has been given to this fact in child psychology. Both types of confusion occur when children are young, generally between three and six years of age, and can be explained on physiological grounds. The chief difference between all three of these mental states is a difference in the kind and in the number of associations with each. In the early years children have few associations with any of them,

How do children differ from adults in the vividness of their images?

and consequently are likely to mistake any one of them for either of the others. They lack definite criteria by which to judge either the actuality of occurrences or the possibility of their fancies; moreover, their proneness to illusory errors, their extreme credulity, their ready suggestibility, combined with their newly discovered power of "being a cause," mentally make, in very truth, the "wish the father to the thought," *i.e.* the assertion the generator of belief in the fact. When through experience children get accustomed to find certain sorts of sensory elements present with their percept of, say, a dog, they will not so readily mistake an image, which lacks these elements, for a percept. Further, the knowledge of possibilities which comes with experience will help to differentiate these several mental states. For instance, when a child learns, not by mere telling but by lack of sensory elements, that lions do not live under little boys' beds, the feeling-of-lion-under-the-bed will be much less real, much more readily recognized as an image of the productive type.

Lies. — In young children these confusions may result in conduct which, while normal, is certainly questionable. One consequence is seen in the so-called "white lies," the kind of falsification which makes children tell such big tales of what happened in school, on the street, at play, at home. This has been already spoken of in connection with the lack of accuracy in children's reports. Looking back on an imperfectly observed perceptual experience we all tend to mix our suppositions of what occurred with what actually took place. With retelling, the story grows, particularly in the direction of the things we would like to have had happen. Little children do all this and more; they can escape contemplating any disagreeable part of the recollection by "pretending" it didn't happen, or they can intensify the excitement by magnifying it. Their

What tendencies in children are due to a confusion of percepts, memory images, and productive images?

preference, like the veritable fairy wand, so changes the outlines of events and emotions, so colors them that the disguise is complete for them and all but impenetrable for the adult. Thus, as seven-year-old D— was walking along a road bordered by a fenced pasture, a mild-mannered cow lifted her head and looked at the child, causing a little trepidation. D— first told of several cows that came to the fence, later that they followed her the length of the fence "roaring," later that a bull and lots of cows ran after her while she threw stones at them, still later that she had been in the field, was chased by a bull and at least fifty cows till she escaped over the fence and routed them by pelting with large stones.

It should be emphasized again that children are not deliberately telling lies, they either really think thus and so happened, or dwell so much on what they wish had occurred that there comes to be no difference in their minds between the world of fact and the world of make-believe. After all, this realm of "have it as you wish," this world of play is so much the more important and vital to little children that why should they not give the adult the benefit of it when he seems interested and begins asking questions? Scolding or punishing for this kind of lying is unfair to the children and does not get at the root of the difficulty. They must be taught the difference between the real and the fancied without detracting from the charm of the latter. Of course, the training which is taking place at this time in perception will help along this line. Requiring children to check up their stories by the actual facts when this is possible is the logical way to bring home to them the difference. One obstacle in clearing up this confusion lies in the fact that so little opportunity is given children of using their constructive imagination under supervision, so that they do not grow accustomed to labeling one kind of thing true, and another false. If parents and teachers would ask children to tell make-believe stories and happenings, and then to tell "true" ones, and do the same

themselves, not only would there be built up in the children's minds standards by means of which they could judge the real and the make-believe, but they would also be having experience in judging between the two. Added to this they would be having the joy of telling a big story and seeing the amazement of the hearers; — both are legitimate delights of childhood which, because of the matter-of-fact point of view of the adult, are not indulged enough. The romancing of little children cannot be ignored because it may become a habit and continue when the original cause of it has passed; on the other hand, children cannot be held accountable for a confusion, the necessary accompaniment of a certain stage of growth, which will gradually disappear as the mental states concerned become properly differentiated.

Night fears. — Another result of the confusion between percepts and images is seen in many of the night fears of young children. Fears have already been discussed, but it must be emphasized at this point that many of these night fears are due to the confusion now described. They may readily believe that there is a giant in the corner of the room, or that the witch on her broomstick is coming in at the window. Adults little know the terrors children suffer, especially sensitive, imaginative children. If they would stop to consider how they would feel, especially in the dark, if they could not distinguish between the world of fact and of fancy, they would have a clearer conception of what children must feel. One way to prevent this type of fear is not to allow children to be frightened. Once thoroughly alarmed, and the child will recall and recall the emotion in connection with all sorts of things. The need of avoiding material which could serve as a center for the emotion is evident. Children should not be allowed to hear stories or see moving pictures which have present any element of the horrible, or fear-inspiring. In this connection it must be remembered that what is "the horrible" to a child is not that which is horrible to the adult

because of a difference in content; likewise what frightens the child when it is recalled, is often nothing that frightened at the time of telling, or may be nothing frightful in itself. The manner of telling the story, the emotional attitude of the teller which calls out the same emotional response in the children, is often more important than the mere content of the story. It is a great temptation to the good story-teller to use her power so that her listeners are hanging breathless and sometimes trembling on her words. It seems harmless enough, the children respond with a shriek of joy as the story ends, they may play it all over again in their free time; but at night, alone in the dark, what was thrilling in the daylight with companions about may become a source of exquisite terror. These facts should be borne in mind both in selecting the myths, fairy tales, and stories which children hear, and in the manner of telling them.

Imaginary companions. — Still a third result of the confusion of percepts and images is the creation of imaginary companions. The presence in a child's life of imaginary companions is very much more common than has been supposed. It is perhaps the continuation of the animistic tendency, only now it is an image that is endowed with life. These companions usually appear between three and four years of age or even earlier, the time when children are experiencing this confusion between mental states, and the time when they are becoming acquainted with their different selves. It is usually a lonely child that develops these play companions, and they become to him more real than his living playmates. The little girl who, when shopping with her mother, began to cry violently and could not be comforted until her mother discovered that she had sat down on a stool upon which the child's imaginary companion was seated so that the child was sure she was killed, is an illustration of how real such companions are, and also suggests some of the difficulties that may arise if this sort of thing is carried too

far. Very few children retain these after eight or nine years of age, as they gradually fade away under the influence of more vital companionship with other children who are congenial. In general the tendency to indulge in these playfellows is harmless; however, if it is carried to an extreme by young children or if it is continued up into adolescence, harm may result. Children who play continually with an imaginary companion lose all the give and take that comes with living children; they get no training in considering the rights of others, nor in coöperation, and it is very easy to form the habit of shifting the blame whenever anything goes wrong to the shoulders of this imaginary companion. All of this hinders the best social and moral development. If the play is continued into adolescence there is danger of becoming reserved and morbid, and losing the perspective as to real values.

Differences in amount of imagery. — One other difference between children and adults in their images is a natural outgrowth of the differences already discussed, and that is the differences as to amount. It is certainly true that children have more of the concrete kind of imagery than adults, and the probability is that in total amount they excel the adult. The higher types of mental states, the meanings, which are so important in thinking, are later in development than the image. The adult's thinking is full of feelings of relationship, meanings, and judgments, whereas that of the little child is made up almost entirely of images. The rich flood of imagery possessed by children has its drawbacks. One cannot get very far with that type of mental stuff; the other more subtle and far-reaching mental states must be developed.

How do children differ from adults in the number of images they have?

DRAMATIZATION. — Two other topics connected with the imagination have practical bearings on the development of children, viz.: dramatization and symbolism. Dramatization is the working out by the child of his constructive images

in terms of action. It is not an instinct, but is part of the tendency towards general physical activity, and of the law of habit whereby ideas that have been connected with actions tend to result in actions. That it is valuable as a means of development there can be no question, but that there are dangers connected with its misuse is equally clear. Working out a constructive image in terms of action necessitates a clearing up of hazy parts, a working out of details, thereby making the idea more clear and definite. It organizes the imagination by developing a perspective, and making clear the need of emphasizing essentials. It helps to make clear the difference between the imagined and the real. It adds a richness to the thought content by its arousal of an emotional background. It develops coöperation, initiative, self-confidence, and the use of language, and is an aid to memory. All this, if properly used, is a means to an end. But too often the means becomes the end. The teacher wants a finished product, and therefore the planning of details and the work of interpretation is hers, if not entirely, at least so much so through suggestion, that what might have been of great developmental value becomes a trivial performance in which an inexcusable amount of time and energy is wasted. Because its true function has been lost to sight and presentation has become an end in itself, the children who do it best are those chosen to do it, instead of the work being given to those who need the development in any of the above-mentioned ways. It should also be remembered that the very ease with which the emotional element is aroused by dramatization brings with it a danger. An emotion aroused by the part a child takes may react unfavorably on his character, or he may form the habit of allowing the real emotions, whose function is to inspire conduct, to wear themselves out in acting. For the majority of children these are not grave dangers; but if the dramatization is overdone, for the highly

What are the value and the risk of dramatization?

emotional, sensitive child who has a tendency to act, some such effects may be produced. This is especially true if the continual urging of the teacher is to " throw yourself into your part," " lose yourself in it." To be used effectively, the teacher must keep in mind both the function of dramatization in the whole scheme of development, and the nature of the children with whom she is dealing.

SYMBOLISM. — It has been customary in the conservative school of kindergartners to use symbols to teach great truths. For instance, the sphere has been used to represent unity, and the doctrine has been that the child in playing with the ball or sphere must absorb something of that meaning. All the Froebelian " Gifts " have been regarded in the same way. The Mother-plays symbolizing great truths must have effect on the child who plays them. The knight of the Middle Ages is the symbol for bravery, and in playing the plays of the knight the child is supposed to get an ideal of bravery, something with meaning. Religious teaching is full of examples of the same supposition. This whole discussion of imagination should show that such teachings are folly, based on lack of understanding of the development of a child's mind. Symbols are used only after direct personal experience of the thing symbolized, not before. Children do not possess abstract truths, nor generalizations; how then could a symbol call them to mind or stand for them? They are the product of much teaching and experience, and are characteristic of the philosophical adult mind. Even those teachers who use such symbols may have themselves but a faint glimmering of what the abstractions they stand for really are. The parables of the New Testament made no such mistake in their appeal to the hearers as many a zealous Sunday School teacher does to-day. To use something outside of a child's experience, something strange and new, in order to teach an unknown truth is incomprehensible, he has content for neither. Certainly such a use of symbols violates

the law of apperception. Children use symbols only for known experiences, and those symbols must be as nearly like the thing represented as possible; that is all that is possible for the child mind to grasp. This does not at all mean that such material and plays may not have a value; but if so, that does not lie in their power to teach great truths.

That imagination is valuable is evident, but all kinds are not equally valuable, nor valuable for the same purpose. The schools must discriminate and cultivate the different types at their proper time, and in their proper place. The most crying need is for greater emphasis on constructive, verbal imagination, for that is the type upon which thinking depends; but at the same time, individual differences must not be lost sight of, and a capacity for rich, concrete imagery in connection with art and literature should be developed for the sake of its appreciative and interpretative value. If it is true that "Imagination has the power to alter the face of the world, to bridge distance, to annihilate time; like an alchemist, it can transmute, refine, transform; like the artist it is skilful to glorify and to enrich. On the moral side of life, it knows how to comfort and encourage, to inspire and control, to animate, and to rejoice," then every child in our schools needs it trained and developed that he may reap these rich benefits. But before this desired end can be reached, teachers must recognize its importance for life, and not merely for enjoyment, and devote much more time and thought to plans for its development.

Exercises

1. Collect instances of children's faulty apperception or other mistakes that may be due to the particular form of imagery employed.

2. Recall your own adolescent daydreams. Write out a brief description. How do they illustrate the points described in this chapter? Were they much influenced by books you read, people you met?

3. Collect illustrations of symbols used in teaching that might well be postponed for the reasons here discussed.

4. Observe for half an hour to an hour each the free play of (*a*) children under seven, (*b*) children of nine to twelve. Into how many of their games does dramatic imagination enter?

5. Get a six-year-old and a ten-year-old to tell you a story. Note whether one is fanciful and the other realistic.

6. Observe dramatic play of six-year-olds and of ten-year-olds. How do they differ in (*a*) source and kind of material dramatized? (*b*) spontaneous use of dialogue?

Questions for Discussion

1. What should be the teacher's aim in calling for dramatization in the first two grades?

2. Illustrate the kind of training necessary to help children distinguish between fact and fancy.

3. For what sort of school subjects are concrete images valuable? For what are verbal images preferable?

4. What school subjects train constructive imagination? Creative imagination?

5. Compare results of exercises 4 and 5, above. What conclusions do you draw as to changes in imagination with age?

References for Reading

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CHAPTER X

THINKING

ORIGINAL BASIS OF POWER TO THINK. — Of all the various powers that man is heir to, his power of thinking is the most important. It is most important because it explains man's position in the animal scale. Because of it he reigns supreme in the world of nature, farthest removed from the animal type of mind. But this difference after all is one of degree rather than kind. Some animals possibly use a thinking process, but if they do it is as the flash of summer lightning, gone before it accomplishes anything, with nothing to insure its return; whereas with man, from infancy up, thinking is a common process, one which when cultivated produces the wonders of modern philosophy and invention. That man has this power is just as much a matter of original nature as that he sees or moves. It is just as much dependent on structure as seeing is dependent on the presence of an eye and its nerves; but as thinking is more complex than mere seeing, so the structures upon which it depends are more complex and numerous than are those of the eye. In fact, thinking involves and requires the full equipment of the human being. "The peculiarly human features of intellect and character, responses to elements and symbols, are the result of: first, a receiving system that is easily stimulated by the external world bit by bit (as by focalized vision and touch with the moving hand), as well as in totals composed of various aggregates of these bits; second, of an action system of great versatility (as in

Is thinking the result of primary or of secondary connections?

facial expression, articulation, and the hands' movements); and third, of a connection-system that includes the connections roughly denoted by babbling, manipulation, curiosity, and satisfaction at activity, bodily or mental, for its own sake; that is capable of working in great detail, singling out elements of situations and parts of responses; and that allows satisfying and annoying states of affairs to exert great influence on their antecedent connections." [1] Because man's original nature provides him with power to make secondary connections, and to be satisfied when they occur and to be annoyed at their absence, he must, as an inevitable consequence, think. The delicacy and complexity of the cell structure of the brain are shown by the presence in man's original nature of such tendencies as vocalization, manipulation, facial expression, curiosity, and the action of the secondary connections which we call mental control. Given a nervous system which operates in small parts and forms numerous associations, then definite ideas, as opposed to vague sense impressions, must appear. The individual responds to parts of situations, to elements and relationships, he comes to feel abstractions, to make judgments, and to express such feelings. Thinking, then, takes place as a matter of course.

It develops early. — Thinking is not a characteristic merely of the adult human, but it is found in the species as soon as these free ideas emerge. As Dewey defines thinking, — "A matter of following up and testing the conclusions suggested by the facts and events of life," it may be observed in even an infant. Noticing that the back and front views of people, though so different, yet mean the same person — wondering over the appearing and disappearing of objects and people behind furniture, through doors, in boxes and drawers, in the delightful game of peek-a-boo — puzzling over the metamorphoses of people by clothing — these and many other similar daily experiences are stimuli to thought, in the sense

[1] Thorndike, Animal Intelligence, p. 281.

of feeling relationships, for a baby under twelve months. With the acquisition of language individual feelings of meaning are clarified and simple judgments expressed. Many illustrations of even good reasoning may be found in children under three years of age. Later, all the life of play and of the imagination, the interest in things and in people, the tendency to make and collect articles of varied types, the interplay of the social instincts, — all of these stimulate and necessitate thinking. The difference between children and adults is not in the absence in the one and the presence in the other of such mental processes as come under the head of thinking, but rather a difference in degree; for both possess the power because its roots are found in the original nature of all human beings.

The chief **DIFFERENCES BETWEEN THE THINKING OF ADULTS AND THAT OF CHILDREN** may be discussed under three heads: differences in amount, differences in accuracy, and differences in data used.

In what way does children's thinking differ from adults'?

Children think less than adults do. — It has been customary to assert that children do not think so often as adults, that the amount of thinking done by children in a day is less than the amount done by adults in the same length of time. This is probably true; but when one realizes what creatures of habit adults are, what slaves to custom and tradition, what blind upholders of what is, one wonders how great the difference is after all. Consideration of the mental life of the thousands in the factories and mines, of the women who are overworked in the home, of the overdriven men and women who hold positions in the business world, even of college students, forces any observer to the conclusion that little, very little thinking is done by the average adult. There can be no doubt that a gifted child of six or seven will do many times the amount of thinking in a day that many adults do. The differences between children of the same age in thinking power, and that between adults of the same degree of maturity

is probably greater than the difference between children as a class and adults.

Bearing these facts in mind, the first statement that children on the average do not think so often as adults, is true. There are three principal reasons for this difference. First: the *character of the adjustments necessary to young children is predominantly mechanical.* They have to learn to control the various parts of their bodies, to talk, to use the common tools and utensils. Their mental life centers largely in the sensory sphere, their conduct is controlled by instincts. In the field of imagination, the spontaneous, uncontrolled type holds sway. Children must possess a fund of free ideas, of percepts and images, of responses of conduct, before much thinking, which consists in the control and testing of such reactions, is possible. This, of course, does not mean that in early childhood there is no thinking. It has already been pointed out that children of three years of age can and do think, but it does mean that much of children's time and energy must be given to acquiring the mental stuff necessary to thinking. They must have had a certain amount of experience, reached a certain degree of adjustment before problems appear, and therefore before thinking is necessary. All along the line from babyhood up, thinking appears in connection with the development of all the physical powers and mental abilities; but the more mature the individual, the less should be the amount of unreflective consciousness, and the greater should be the preparation for thinking. Children think less often than adults partly because more of their time has necessarily to be given to mechanical processes of acquiring material for higher kinds of thinking.

Why do children think less than do adults?

The second reason for the fact that children think less often than do adults, and from an educational point of view a more important one, is that *the tendency* is not stimulated, *is even inhibited by their environment.* Problems are not allowed to

arise in the child's world, or if they do they are immediately solved by overanxious or careless adults. Toys lost or broken are allowed so to remain or are replaced depending on the mood or the ability of the adults; but in how few cases are the children allowed, with help, to solve the problem thus occasioned? They get no spending money at all, or else having some, are told just what to do with it, or are allowed to spend it with no guidance. They are told what to do, are shown how to do things. They are shielded and protected, and made to imitate and conform until the natural spontaneous tendency to think is well-nigh killed through disuse. That both the power and the inclination to think exist in children at an early age is shown by their reactions in free play when the overzealous adult is out of the way; then, in the stimulating environment of other children or even of their own world of fancy, little children see problems and solve them in greater abundance than adults dream, unless they have watched with the motto, "Hands off." In the slums where problems are many, where even the problems of food, shelter, and clothing confront the children, they think and think well. Wherever the environment presents problems, the frequency of reflective consciousness increases. Children think as little as they do partly because adults will not give them opportunity to do it more often.

A third reason for this lack is the fact that *discomfort is actually made to follow the exhibition of the tendency.* That may seem to most people a preposterous statement, but a little reflection will prove its truth. Tendencies to think are nipped in the bud because they are troublesome to manage. Consider the hundreds of questions normal, healthy children of four will ask in a day with the effect that before long the adults, having reached their limit of knowledge, or of nervous energy, tell the children to stop asking questions, or to keep quiet; with the result that not only do most children stop asking questions, but they also stop thinking questions. Of

course, it is true that sometimes children ask questions without either expecting or wanting answers merely to hold the adult's attention if possible; but this happens comparatively seldom with most children, and can easily be discouraged. It is no easy task to answer a child's questions, and a still more difficult one to answer them in such a way that thought is stimulated still further; and yet not to do so is to inhibit one of the most necessary phases in the development of a thoughtful man or woman.

Not only is the asking of questions discouraged, but children's attempts to think things out for themselves are often greeted with shouts of laughter by older members of the family, and are repeated to others in the children's presence with such exclamations, as, " Is not that funny? " " How do you suppose she ever got that idea?" " How do children get such queer notions? " The effect of such an attitude on sensitive children is disastrous. To have their honest attempts to answer the questions experience puts to them held up to ridicule, or even commented on and exclaimed over, takes away their self-confidence; children soon give up such attempts, and simply sink back with an " I don't know," or come to depend absolutely on adults, or later on books, for the answers which at one time they were ready and anxious to try to find for themselves.

A little later, when they are old enough to attempt experiment at manipulation of things, their efforts meet the same kind of discouragement. Of course many of the experiments turn out wrong, bringing results that the children had not dreamed of; they, in consequence, are considered " naughty " and " troublesome." The children of a surgeon who, hearing much of operations of all kinds, cut open the hens, emptied their crops and carefully sewed them up again to see if they would live, would in most cases receive such a punishment that all desire for experiment would be absolutely killed. The actions of the child who tears up the cushion to see if

there are real feathers inside, or who sets the water jug out-of-doors in zero weather to see if the water will freeze and crack it, or who tries to walk backwards downstairs and gets a bad fall, or who takes the clock apart to see if he can put it together again, — these, and hundreds of other honest attempts to test knowledge and power, are condemned by the shortsighted adult as deliberate mischief making, and punishment is meted out to the investigator. And how the average teacher dreads the " original," " curious " child — the one who always has another question to ask, or who always has another way to suggest, or who is always popping up in unexpected circumstances. Yet these are the very signs of the characteristic which in theory we are striving to cultivate — independent thinking power. No, in practice it is the unobtrusive, quiet child, who " stays put," who receives with ready mind all that is given him and never objects, who does what is expected of him in the usual way, — he it is who gets the rewards; and consequently the large majority of children soon moderate in their zeal to do and to think, for it is human nature to take the road that brings least discomfort. Thus they become little imitators, nothing more than passive vessels into which the adult complacently pours whatever he thinks needful. Later the adult stupidly wonders at the lack of originality and reflective power which they show.

The effect of this attitude of adults may easily be seen when one compares the expressiveness and alertness, the eagerness to do and to think of kindergarten children with the passivity and indifference of many early grammar grade children, especially those drilled rigidly in parochial schools. Is it any wonder that children do not think so often as do adults with lack of opportunity, discouragement, and sometimes actual discomfort following upon their attempts? A change in these conditions always results in increased frequency of reflective activity in childhood, and therefore gives greater promise of power in later years. Habits formed now are far-reaching

in their effects; and if because of inhibition by factors in the environment the natural tendency to think is replaced by a tendency to depend on others, it is extremely difficult in later years to call it into activity.

Children's thinking is inaccurate. — The second great difference between the thinking of children and that of adults is in the accuracy of the results. Children are more likely to make mistakes, to reach incorrect conclusions than adults are.

What are the main reasons for children's thinking being inaccurate?

There are several reasons why this must necessarily be so. In the first place, their *supply of facts is not adequate.* Children lack experience, they do not possess much of the knowledge adults have, and therefore, when they try to think things out, although their thinking processes may be perfect, their conclusions may be incorrect because the crucial fact, the one upon which the solution hangs, is missing. The child who vigorously tugged at his mother's hair, and when expostulated with said it did not hurt dolly, lacked the knowledge of the difference between people and dolls. Time and time again the thinking of children in arithmetic, geography, and the other school subjects is inaccurate, simply because of the lack of data. Without facts and experience thinking is impossible, and the larger the amount of data the greater the possibilities of thinking.

In the second place, *the material they do possess is apt to be inaccurate.* The tendency of children to be careless and inaccurate in their observations was pointed out in connection with the development of perception. Thus the material which children do possess, the premises from which they reason are often false or incorrect, and therefore when these are used in their thinking of course incorrect conclusions are unescapable. Further, the form in which children's experience and knowledge exist is conducive to inaccuracy. The mental states that develop first are chiefly affective states, crude sensations, percepts, reproductive object images, a few

objective feelings of relationship, and thinking cannot be carried very far using mental states of these types. Of course, children are not absolutely lacking in other states, but these develop slowly, and meanwhile their thinking is inaccurate. Feelings of meaning, especially abstractions and concepts whereby one may substitute for the total state the reaction toward one quality, or the concept standing for hundreds of gross sensory experiences; feelings of logical relationships, that is, of cause and effect, of coördination, or subordination, of concession and so on; constructive and verbal images whereby one may foresee the outcome of the present or plan for the future; judgments of the explicit type which, replacing the unreliable image, are more permanent and at the same time show reflective results, — all these are necessary before thinking can be carried far, and to successful conclusions. These in children are imperfect, undeveloped, the very thinking itself is necessary to develop them; and so long as this is true their thinking must be inaccurate, for the tools with which they are working are not adapted to the use to which they are putting them. They are not reliable enough, nor are they all of the kind to carry on the process of thinking efficiently.

In the third place, *the character of children's attention makes accurate thinking difficult.* Thinking requires that the problem be held clearly in mind, and that the material offered be accepted or rejected in accordance with its bearing on the question at hand. Now this selective activity requires concentrated, sustained attention to ideals. Children's attention, as has already been noted, tends to lack in concentration and to be easily distracted; and these characteristics are the more marked when the attention is given not to perceptual objects but to ideas. Children may have all the data necessary to solve a given problem and have it in the most usable form, and yet reach an incorrect solution merely because they could not hold attention to the question long enough and

clearly enough to make use of what they have. How often it is true that a teacher finds that after a few minutes of work some of the children have absolutely lost sight of the problem, and are going along in a haphazard way with, of course, the inevitable result, — a wrong answer. This inability of children to keep their attention to the point in question is illustrated by their tendency to take the first idea that offers itself irrespective of its bearing on the problem. Children asked to define or describe objects which they know perfectly well will give answers such as the following: "A hen is sometimes black." "A box is what I like." "A policeman is my father." So long as this tendency is strong in children, their thinking must be correspondingly inaccurate.

In the fourth place, this last tendency involves more danger in accuracy from the fact of the *lack of systematization of a child's mental life.* For an adult to take the first idea offered, due to lack of sustained attention to the problem, might not lead him far astray because his ideas on each subject tend to run in systems, to be more or less closely connected by logical relationship; but with children this is not so. Such an organization comes only as a result of experience and of trained thinking; and both of these prerequisites children lack. Their mental life is in a chaotic condition, the connecting element between ideas being mere propinquity, or a superficial likeness, even a verbal resemblance. In thinking out the problem — Why is New York harbor a good one? — adults might not go far afield if they took the first idea that presented itself, because the conditions and requirements of good harbors tend to be associated about the topic, and therefore any path chosen would be likely to lead to fruitful results. Children, on the contrary, lacking such orderly arrangement and following the same tendency, might come to some conclusion that had absolutely nothing to do with the problem such as: "Because it has the Statue of Liberty." "Because the Hudson and the East Rivers empty into it." "Because

all the vessels of the Hudson and Fulton celebration anchored in it." Lack of systematization is one handicap to the correct solution of problems, and this is necessarily characteristic of the immature mind.

In the fifth place, *the type of association* characteristic of children is much like that of the lower animals, viz.: *association of wholes*. The mind works coarsely in whole situations, and therefore discrimination and analysis are difficult. James' illustration of the child who knew "vertical" only when his father held a pencil in that position because a pencil had been used in the teaching of the word, is a case in point. Children, and adults too for that matter, who can answer a question correctly when asked in a certain way but fail if it is framed a little differently, are responding to the whole situation, instead of to the important element in it. Mental activity that is organized in such rudimentary, undifferentiated fashion can go but a little way toward solving a problem. That type of activity will never respond to meanings irrespective of their carriers, nor to elements irrespective of the situations in which they may be found, nor to relationships irrespective of the particular wholes between which they may at present exist. And thinking requires all this. It is the "piece-meal" activity, the activity involving small parts of an associative system, that makes thinking possible. So long as the coarser form of association predominates thinking must be equally crude; only when because of age, experience, and training, the subtler and finer form of association becomes more pronounced can thinking be carried on accurately.

In the sixth place, *children lack a critical attitude*, and hence often go astray in their thinking. This lack of criticism works in two ways: because of it, children accept some minor, unimportant element as the essential one in the problem, and also they fail to weigh and test their results. In most thinking, the key to the problem depends upon the substitution of some part, element, or aspect of the situation for the whole

situation. The element selected will, of course, determine the course of association, and therefore the answer. To pick out the right element from among the many offered requires keen discrimination, a valuing of the element from the standpoint of the problem; in short, it requires a critical weighing of the respective merits of all the possibilities offered. This children do not do, partly because from lack of experience with the various elements of the material offered they do not know which is the essential condition, but also partly because they have not the attitude of criticism towards what is offered. The child who, having been accustomed to hearing stories told her at bedtime, asks to be put to bed in the morning, in order to have stories told, is a case in point. An unimportant element is selected as the essential one, and hence the result of the thinking is incorrect. The same defect is illustrated by children who, having been taught addition by the use of shoe-pegs, and subtraction by the use of beans, always added when shoe-pegs were given, and subtracted when beans were distributed, irrespective of what the problem called for. This lack of a critical attitude towards the element selected is not by any means confined to children; it is manifested by adults again and again, in fact, is one of the chief reasons for defective thinking whenever found. However, simply because of the lack of experience and training, as well as because of the type of association found in children, they show it to a more marked degree than do adults. This lack of a critical attitude is manifested again in the attitude of children towards their results. They tend to accept them without any further consideration, whereas an inspection of the result in the light of the problem, or testing of the result to see if it would work, would often show that it could not possibly be correct. Older children and adults, because they are more critical, save themselves from accepting something totally wrong as the right solution; but this tendency is not characteristic of the child mind.

These six reasons for inaccurate thinking on the part of children overlap in several instances. They are interrelated so that defective action of one type often involves others; however, they are more or less independent causes of mistakes, and in training each one must be reckoned with. This discussion of the defects in children's thinking bears out the statement made earlier, viz.: that thinking is a complex operation involving practically all the types of mental states and processes. As it is the capstone of man's power, both intellectual and moral, any weakness of the simpler parts is a structural defect. Incomplete or inaccurate perception, defective memory, poor habits of attention, lack of development of the more effective types of imagery, — all these have their effect on thinking, making it more difficult and causing inaccuracies. If the whole fair palace is to be steady, the foundation must be well laid and the materials sound.

Children's problems are different. *Triviality is a relative term.* — Another difference between children and adults in their thinking is in the character of data used. In adult life, thinking is done in connection with problems that have a direct bearing on the well-being of the individual, or his family, or the community at large. It is in connection with business problems, or questions of politics, or religion, or social conditions, that adults are called upon to think. The results of this thinking are fairly evident and very often valuable in a practical way. We make this adjustment, are successful in this way or that, get along in the world, deal with people, propound a new theory, suggest means for social betterment, publish a book, or perfect an invention, and in each case, something of value from the standpoint of the world at large is accomplished. In childhood all this is different. Children's thinking is done largely in connection with their play; their little problems are often unknown to adults or thought to be trivial and pointless if known. They apparently

What differences in stimuli are there between adults' and children's thinking?

accomplish nothing worth noticing as a result of their thinking. Of what account is it that a child, as a result of his own thinking, has found out the quickest way to get dressed in the morning, or how he can beat Johnny in getting to school, or how the doll's eyes work, or which is the best spot to fish in? The average adult ignores all such thinking as not worthy of the name. This is but another of the countless instances of the unfairness and shortsightedness of adults in dealing with children, when they consider worthless any data, processes, and results that are unworthy of adult thinking. Of course such an attitude is manifestly unfair. Children cannot be judged by the same standards as adults in any sphere of thought or conduct. Thinking of the type illustrated is just as valuable, just as significant, just as difficult for the child as the more abstract and complex variety is for the adult.

No abrupt change at adolescence. — The fact that much of the childish thinking has been ignored because of the triviality of the situations occasioning it is one origin for the theory that at adolescence comes an awakening of the thinking powers. Childhood has been designated as the unreflective period, and adolescence talked of as if at thirteen or fourteen thinking power and reasoning suddenly developed. The truth of the matter probably is, that in the adolescent period the problems dealt with are similar to the problems confronting the adult, and therefore receive recognition. There is no experimental evidence to show that there is a sudden birth of thinking power at this time. In fact, all the evidence goes to show that it is a gradual development beginning in early childhood, and continuing to maturity, — not necessarily a regular growth, but a continuous one. Another reason for the prevalence of the theory is that in the adolescent period, because of the aggressiveness of youth, more freedom is allowed, and therefore more opportunities for problems arise with the resulting attempt at solution. The difference in actual power

between the little child and the youth is thus exaggerated by environmental conditions.

NEED OF TRAINING IN THINKING. — To say that children need training in thinking is superfluous. Nothing is more discussed in pedagogical literature to-day than this need. Teachers are exhorted on all sides to make children think. Despite all of this discussion, little progress has been made in meeting this need, little has been accomplished in developing ability to meet life's problems and solve them successfully. Progress in this field must necessarily be slow for several reasons: the limitation of the individual because of lack of natural endowment shows particularly here, the complexity and delicacy of the process involved requiring not only power on the part of the learner, but great skill on the part of the teacher; the organization of the school itself makes this sort of development difficult; lack of knowledge of child nature is a serious handicap. Only when the child's power is fully recognized and made use of at the different stages, and when the difficulties in frequency and accuracy of thinking are known, and when teaching is definitely planned to overcome them, will training in thinking accomplish the results that are desired by society. The lines this training should take are, as has been suggested, to see that children do meet problems, that we refrain from doing for them what they may be encouraged to do for themselves. Which is worse, the effect of the officious adult on the child's ability or the effect of the meddlesome child on the adult's temper? Then, from sympathy with children's need for knowledge, to answer their questions simply, truthfully, yet tentatively, as a stimulus rather than a check to further thought. More, their investigations must be regarded not as malicious offenses but as, possibly misguided, laboratory experiments. Space and safeguarded opportunities for activities are needed more than reprimands or penalties. Then, copious fact-giving, together with the

What will training in reasoning involve?

scope for varied and immediate contact with things, in themselves supply a greater range and accuracy of data from which to reason along higher lines; but especially when dealing with abstract problems, assistance must be given in the form of constant reminders of the point at issue, suggestions for systematizing ideas, criticisms of the relevancy of thoughts as they occur. Drill will be needed in analysis, in picking out the significant part of the whole situation, in testing the results of thinking, especially in forming the habit of supporting conclusions by stating explicitly the premises from which they are derived. Further, we must not only present problems of interest to children, but realize that results which are trivial to us are dignified and worthy to them.

Exercises

1. Collect instances of thinking and reasoning of children.

2. From the instances collected, explain any inaccuracies by one of the six causes discussed in this chapter.

3. Classify the examples given below, in similar fashion. (The first 14 are taken from Brown's "Study of Children's Reasoning," in Ped. Sem., Vol. II.)

A. Age 1 yr. 8 mo. After visiting a bald grandfather, child renamed a doll whose hair had come off "Grandpa."

B. 2 yr. 8 mo. F. saw the moon when it was full, later in its first quarter, thought her little brother had been meddling with it.

C. 3 yr. G. planted a dime in the garden expecting to be rich when it grew.

D. 3 yr. When H.'s father overslept one day she asked if it was Sunday morning.

E. 3 yr. 8 mo. L. criticized her aunt's method of darning, "Oo ain't darnin' . . . right at all; my mamma puts 'em on a darner."

F. 4 yr. "I would like to go out in the rain and get bigger, 'cause the rain makes you grow."

G. 5 yr. On seeing a crooked tree, "See that tree sitting down."

H. 5 yr. 8 mo. Referring to the ownership of gray eyes, "You are getting to be an old woman."

I. 5 yr. B. heard the noise of frying pork and simultaneously the cat crying, and reported later that they were frying the cat's tail.

J. 7 yr. E. turned over the picture of a girl "to see if her dress was buttoned in the back."

K. 7 yr. 8 mo. X. watching black smoke rising from a mill chimney stack said it would rain next day, for "black smoke makes black clouds, and that's the ones that rains."

L. 9 yr. Bethlehem is judged near the equator, because the mother is pictured wearing a lace dress, which would be worn only where it is hot.

M. 10 yr. 9 mo. Child thought it would be colder riding than walking "because you are higher up in the air."

N. 12 yr. 3 mo. F. buried his kitten in a very shallow grave because he had heard that cats have nine lives and "if his cat came to life he didn't want it to smother."

O. Children under five will either inquire if it will hurt their dolls to treat them in various ways, *e.g.* stick pins into them, leave them out in the cold; or are convinced that their dolls think, feel as they themselves do.

P. Children even of kindergarten age may ask such questions as "When I'm big will mother be small?" Myers' boy asked, "When I was a big boy where did Daddy come from?"

Q. Myers' boy at 3 saw the wagon wet and concluded it must have rained.

4. What is the value of exercises such as the following for children in the fourth, fifth, and sixth grades? (They are taken from Bonser's monograph on "The Reasoning Ability of Children.")

Directions. As quickly as you can, make these sentences correct by drawing a line through the wrong word where two words occur, one above the other.

Iron is $\frac{\text{softer}}{\text{harder}}$ than wood.

Shadows are $\frac{\text{shorter}}{\text{longer}}$ in summer than in winter.

Anything that floats is $\frac{\text{heavier}}{\text{lighter}}$ than water.

Oranges are $\frac{\text{more}}{\text{less}}$ sweet than lemons.

Among these reasons why horses are better than cattle for driving and working animals, check those which you think are good reasons.

1. Horses are more intelligent than cattle.
2. Cattle are not so tall as horses.
3. Horses like corn, oats, and hay.
4. Horses are much more active and walk faster than cattle.
5. Cattle are extensively used for food.
6. Horses are much more beautiful and graceful than cattle.
7. The skins of horses are sometimes made into gloves.
8. Horses are more easily trained and controlled than cattle.
9. President Roosevelt likes to ride on horseback.
10. Horses have more rapid and varied gaits than cattle.

Questions for Discussion

1. What school subjects offer most constant opportunities for training in reasoning?
2. What special training value for thinking is there in the constructive activities of manual training, garment making, cookery, shop-work, etc.?
3. How may training in reasoning be made of moral value?
4. What means of verification should children be trained to use?
5. What habits need to be formed in connection with reasoning?
6. Why is it more difficult to teach pupils to think than to teach them to memorize?

References for Reading

Dewey, *How We Think.*
Bonser, *The Reasoning Ability of Children.*
Miller, *The Psychology of Thinking*, chs. 10, 14.
Sully, *Studies of Childhood.*

CHAPTER XI

GENERAL TENDENCIES OF ALL THE TENDENCIES, — HABIT AND LEARNING

PLASTICITY THE PHYSIOLOGICAL BASIS OF HABIT-FORMING. — So far the topics under consideration have been definite tendencies to action, to feeling, and to thought. They have been particular bonds between situations and responses. These bonds have been in terms of neurone-systems the synapses between which were open as a matter of natural equipment. But these bonds by means of which a man is sensitive, or acts, or thinks, have themselves certain tendencies or characteristics, the most important of which is that one which results in permanent modification, known as learning, or habit. This characteristic has been generally called "plasticity." Man above all other animals possesses this something, and children are characterized by it to an extreme degree. Plasticity means the power of neurones to be sensitive to what happens to them, and to be changed permanently thereby. Of course, it is the synapses in particular that are so affected. This fact of the plasticity of the connections, together with the richness both as to number and variety of man's original equipment, accounts for his supremacy over all animals in power to learn. If either factor were less perfect than it is, there would result decreased educability. A lessening of the richness and complexity of the responses grouped under such heads as manipulation, vocalization, attention, mental control, would enormously change his power of learning; if the synapses

For what reason is habit-forming possible?

were less sensitive to currents passing over them, or were less permanently affected by them, the same result would ensue. Both the definite bonds and plasticity of such bonds are necessary to explain the difference between man and the lower animals in respect to learning; for learning has always to do with the modification of some definite response of thought, feeling, or action.

Variation in plasticity. — Three questions arise in connection with this characteristic of plasticity: (1) are all bonds equally modifiable? (2) is this plasticity equal at all ages? (3) are some bonds more open to modification at certain ages than at others? Taking these three questions in order, all bonds are not equally modifiable; those controlling the physiological and reflex operations are but slightly modifiable. Among the so-called instincts such responses as those connected with fear, food-getting, and mastery are less modifiable than those connected with vocalization, manipulation, and attention; but all in this group are more modifiable than those in the first group. The bonds having to do with the secondary connections and capacities are most modifiable. With regard to permanence of the modification, it seems probable that those bonds made up of sensori-motor connections hold the effects of modification longer than those connections which are sensori-associative, or associative-associative. In other words, learning which results in such habits as skating, cricketing, sewing, piano playing, typewriting, will probably be more permanent than learning which results in memory of historical facts, or poetry, knowledge of geometry, or linguistic skill.

Age differences in plasticity. — Plasticity is not equal at all ages; childhood is the most plastic period. The discussion of the retentive power in children is an illustration of this point. Much has been made of this fact, and the value of infancy from the standpoint of development of intelligence has received much attention. Without doubt all that has

been urged for it is true, but on the other hand, the resulting implication, and in some cases doctrine, that habits can be formed only with difficulty after one is twenty-five and only as a miracle after thirty-five, is untrue to the facts. In the laboratory experiments with adults when the conditions were the best, modification was always noted, and in some cases very great improvement took place. Of course, there are all sorts of individual differences here as elsewhere, but the facts seem to point to a much longer period of learning than has commonly been accepted.

Periods of greater plasticity. — In the third place, as a matter of mere inner growth, it seems to be true that certain neurone-systems are more susceptible of modification at certain times than at others. It is a generally accepted fact that the finger dexterity and suppleness required in musical technique must be acquired in childhood; accent in speaking another language is much more easily acquired in childhood than later, also the skill of the acrobat or tumbler must be developed during the early years. These and many other facts point to the conclusion that has experimental backing, *i.e.* that physical learning comes most easily in early childhood. The " memory period " is believed by many to be between ten and twelve when modification of certain secondary connections takes place most easily, leaving the more complex habits of thought for the years of puberty and beyond. No one of these periods is sharply divided from the other, and modification along all lines is going on during each of the periods, but the rate of modification varies as has been indicated.

Suggestions for training. — These facts have important practical bearings. The great plasticity of the period of infancy and early childhood must result in the formation of habits. Whether the parents know it or not, whether the teacher realizes it or not, the very nature of the child's nervous system necessitates learning. It is affected by all that

happens to it, and something is happening every minute of the day. The environment of the young child is one of the most important influences in his education. Because of the force of reflex imitation working with this factor of plasticity, the emotional attitudes of those by whom he is surrounded leave their impress on the child before he has lived thirty months. His disposition is being formed; he is becoming irritable, quick-tempered, moody, or sunny and cheerful, just which, however, being determined to a larger extent than people realize by the natures of the adults surrounding him, — and this all unconscious to himself, simply as a result of the modifiability of his neurones. In the field of morals and manners, the same element makes itself felt. The old adage — "Let a child run until he is six and you never catch him" — is a recognition of the far-reaching effects of the habits formed in this period.

Why is the training of very little children important?

It was noted above that not only is the plasticity greatest in early childhood, but that it is greater in lines of muscular habits than it will ever be again, and further, that sensori-motor bonds are retained longer than any other kind; therefore, without any doubt, the years before nine are preëminently the ones in which to establish good physical habits. The hygienic habits of eating and sleeping at regular periods, of evacuation; habits of cleanliness and tidiness; habits of posture, carriage of the body, and of walking; habits of language, both of the mother tongue and modern languages; habits of the use of tools and implements, — this is the period when all such are formed. If the habits are good, the child has made a splendid beginning in the race of life, he has capital the benefit of which he will feel as the years pass; if the habits are bad ones, just the reverse will be true, and it must be one or the other. Children in these early years cannot help forming habits; for, as has been said before, it is the nature of their nervous systems to be modifiable.

LAWS OF HABIT-FORMING. — General psychology lays down two great laws of habit-formation, the **law of Exercise**, and the **law of Effect**. These laws cover all sorts of cases of habit-formation from the more unconscious, childish forms to the later, purposive habits. Each law has derivatives, or corollaries. Exercise involves also the intensity and duration of responses, as well as the way they are grouped together in time; effect is modified by the degree of attention paid to situation and response and by the recency of the formation of the bonds. Continued exercise frequently depends upon the effect of the first response made.[1]

What are the laws of habit formation?

It is sometimes surprising to adults to find how much effect in the way of pleasant consequences will outweigh mere frequency with children. They will affirm " We always do this " or " We have it so and so " when perhaps a process has occurred only once or twice, but with results which were satisfying, therefore pleasant to remember, probably idealized. On the other hand, not lack of repetition but frequency itself may be ignored by children when their attention is fixed on the pleasurable effect, as is illustrated by the ecstatic exclamation of " Oh, pie ! " or " Ice-cream to-day ! " to the embarrassment of the mother in presence of visitors, though these viands are by no means rare. Equally arresting is it to find sometimes that even very unpleasant results will not deter a very strong impulse from starting to develop into a habit. Thus a four-year-old child persisted in attempts to reach some attractive wild flowers though he fell three times in the course of one day into a deep ditch full of water, and was chastised each time. Boys continue in physical combat in spite of the pain it entails. Teachers must allow for the intense, yet short-lived emotions of childhood when

[1] For a discussion of these laws see any standard text, *e.g.* Colvin, The Learning Process, pp. 149–154. Thorndike, Psychology of Learning, Introduction.

seeking for suitable motives to supply, and for satisfying results to be brought about so that they are felt in direct connection with the desired response. Also, in cases of exercise of undesirable tendencies in spite of disagreeable effects, the situation should be analyzed further, and counter attractions set up.

From these two general laws **two practical precepts** have been evolved: "Form habits as they will be used," and "Reward good impulses." These seem almost too obvious to merit discussion; yet it is true that no laws or precepts are more often overlooked in dealing with children than just these. For example, though habits come only by repetition and exercise of the learner's own nerves and muscles, yet many parents and teachers seem to expect them to come by magic. Of course they would not admit this, but what else explains their expectations and customs? Instead of seeing to it that children *form habits*, they rest content with mere exhortations or expositions. Mothers expect little girls to be polite with no further training than an exasperated "Don't be so rude!" can give; teachers suppose that children will be able to add 3 plus 12 because they know 12 plus 3. Children are told how to hold pencils or needles, how to use a plane or a paint brush, how to throw a ball or produce a legato touch on the piano, and then adults are impatient when they do not do these things from the mere telling. As though nerve connections used from ear to associative center would bring about automatism from motor center to hand! As bad as these violations of "form habits . . ." is the ignoring of the rest of that maxim, ". . . *as they will be used*." Much time is given to oral spelling and reading, to written language and arithmetic, to composition in art and music, whereas ordinary life situations call for written spelling, silent reading, oral language, mental arithmetic, appreciation in art, rendition of others' music hundreds of times as often as for the

What teaching principles do these laws suggest?

activities mentioned. Then, too, children are drilled in serial habits, such as repeating tables of weights and measures, multiplication tables, principal parts of verbs, declensions and conjugations, lists of dates and the like, when the connections needed in ordinary usage are not these at all but paired facts possibly, or a response to one fact by itself. A serial habit of this type not only omits to form a habit that is to be used, but it is a distinct hindrance to the early stages of the formation of the needed habits.

For any desired habit we cannot trust to mere repetition; it must be repetition *with satisfactory results*. Neutral consequences or unpleasant accompaniments will not succeed in establishing a habit. Children must not be expected to learn their spelling words by repeating them over and over again to themselves with no different result to their consciousness when they repeat correctly from what they experience when they repeat incorrectly. Many times the last line on the page of the old-fashioned copy book was worse than the first, and the last page no better than the first page. Practice will not make perfect unless satisfaction follows the variations that are in the direction of the ideal. Good impulses must be definitely rewarded, and undesirable impulses must fail of achieving satisfaction. Too often this maxim is violated by such practices as granting children their requests if they tease long enough, paying attention to troublesome children and those who are trying to "show off," while ignoring the good, well-behaved ones. Other misuses of the law of effect are such customs as giving children poetry or Bible passages to memorize as a punishment, exaggerating the value of a promised reward, forgetting to comment on an improvement, quoting a child's impudence in front of him as though it were commendable, and the like. In line with these are the schoolroom customs of scoring only the mistakes in composition, drawing, or music, and of giving misspelled words and incorrect syntax for correction; only in

these cases the wrong form of the habit is encouraged by emphasizing it to the exclusion of the right forms.

With young children the responsibility of providing opportunity for exercise, and of making sure that satisfactory results follow effective exercise, rests on the adult, either teacher or parent. Many of the habits which it is worth while for children to form seem to them to be of no value, and therefore, of their own accord, they do not exercise them. Some one to whom their value is evident must provide the opportunities. It is also true that the younger the child the more often must the reward come from without. The aim of the teacher, of course, is so to arrange the situations that the activity itself shall bring its own reward; but that cannot always be the result, and incentives and rewards of various kinds have to be resorted to. The teacher will show her ingenuity and probably secure results if she uses the original satisfiers in connection with the formation of the habit. With little children this satisfaction, whatever it may be, should follow immediately the activity it is supposed to reward. It would be unsafe to defer rewarding a child of five for good pronunciation or clean hands until the close of school; and similarly to keep a child of seven waiting for his reward for the correct holding of his pen or any other habit until the end of the week or month would be foolish. In either case, the child will, of course, be delighted with his pleasure; but the point is that it is not closely enough connected with the working of the particular synapsis to help fix the right discharge.

The facts concerning the greater plasticity of the earlier years of a child's life as compared with the later apply also to any period in habit formation when compared with any later period. The **law of Primacy** has been framed to express the importance of the beginning stages in the formation of any habit. The particular set or bent given by the first few responses to a situation have

What is the force of a precedent?

a much greater effect than the same number at any later period; hence, the way the laws of Exercise and Effect operate at the beginning of any habit-formation series is particularly important, and more so for children than for adults. This is true whether the habits be motor, intellectual, or emotional. And yet how often this fact is ignored in dealing with children in the home and in school. It is the first few weeks in the new class that are so influential in determining the discipline, the attitude towards the work, and towards the teacher; and yet how many teachers say that "it takes a month to settle down," not at all realizing the importance of the beginning weeks for habit. The same thing holds true in beginning a new subject, or in meeting a new friend; it is the first impressions that count for so much. Again, how often it is true that the habits allowed to be formed at the beginning, or in the early stages, are absolutely wrong; and these, because of this law of primacy, are most difficult to break. Children at first accustomed to having each sentence occupy one line form the habit of moving their eyes in accordance with that arrangement, and therefore find it most difficult to change to the habit of picking up the sentence on the next line and reading smoothly. When in the early stages of reading children have been allowed to pronounce each word to themselves, it is troublesome to break the habit when for the sake of rapid reading it is necessary. To how many children geometry has been a most tiresome and difficult subject because, in dealing with the first few propositions, the habit of memorizing them was formed. It is the violation of this law that makes so heavy the task of teaching children to study. In the primary and early grammar grades "studying" to the child meant memorizing, and that sort of studying brought satisfactory results; hence when that sort will not satisfy the conditions, and teachers in the upper grammar grades and the high school try to teach them what the studying really means, they find it most difficult, because of the "set"

given by these early habits. The time to begin to teach a child how to study by other methods as well as rote memorizing is in the primary grades when he first begins to use books.

Other principles. — When the habit formed is a voluntary one, two other principles arising in connection with these two general laws are important. In the first place, it is a help if the child definitely knows what the habit is that he is trying to form. Bagley expresses it in the phrase " Focalization plus drill in attention." This preparation in attention, giving of a mind's set, though important in all habit-forming, is particularly so in two cases: (1) in breaking a bad habit and (2) in producing a partial habit, or set of responses which will later need to be altered or used as the basis for the evolution of principles. Many moral habits would come under this latter class. In the second place, it is of course necessary to gain the interest and coöperation of the child. Having that, he will be more likely to carry out James' maxims for habit-formation, " Never allow an exception to occur," and " Take the first opportunity of putting into practice the responses you wish to make habitual." To gain this coöperation often taxes the ingenuity of the teacher, but the fund of original interests offer a solution of the problem. Once having gained it much of the difficulty in forming the habit is overcome.

IMPROVEMENT. — The business of education is not merely to form habits, but to raise them to their highest level of efficiency; therefore, the psychology of improvement [1] of habits is very important. That this need of improvement is not kept clearly in mind by teachers is shown by the low level of efficiency of the most common habits despite the great possibilities of improvement in them. All the work that has been done in experimental laboratories and elsewhere on all

[1] For a full discussion of this topic see Thorndike, The Psychology of Learning.

forms of practice experiments points to the same conclusion, *i.e.* that all functions are capable of improvement, and most of them enormously so. In adding columns of figures after sixty minutes of practice, children have shown an improvement in speed from 31 columns to 50 columns, and in accuracy from 24 correct to 37 correct. In typewriting, fifty half hours of practice changed the score from 6 to 16 words per minute. Working three examples in mental multiplication a day for 20 days resulted in an improvement of 100 per cent. Thorndike says,[1] with regard to ordinary business habits, that " the majority of men remain far below their limit of efficiency even when it is decidedly in their interest to approach it, and when they think they are doing the best that they are capable of. I venture to prophesy that the 1000 bookkeepers in, say, the grocery stores of New York who have each had 1000 hours of practice at addition, are still, on the average, adding less than two-thirds as rapidly as they could, and making twice as many errors as they would at their limit."

Laboratory and school work compared. — There are four reasons for this striking difference between the improvement in habits in ordinary school practice, and under experimental conditions.

Why do children improve less rapidly under school than under test conditions?

Consciousness of definite goal. — One is that the factors upon which improvement depends are more carefully planned for in the laboratory than in school. In the practice experiments, the improvement worked for is always very definite and clear; it is adding, or striking a dot, or memorizing words, or typewriting by the sight method. There is no confusion in the subject's mind as to just what he is to do. It is not a big general sort of task such as " to do better work in arithmetic," or " to present neater papers in English," — but one or two factors involved in this complex task are analyzed out,

[1] The Psychology of Learning, p. 179.

focused in the mind of the subject, and worked for. Hence the improvement. The aim must be definite, and must be held clearly in mind, if children are to improve. The chief trouble is that teachers have not considered their work from this point of view. They often do not have clearly in their own minds just what habits of responses in terms of thought, feeling, or action they are working for in any given subject, much less having it clearly defined for any given lesson. The children, therefore, cannot improve very fast or very much.

Speedy working of law of effect. — A second reason is that the law of effect plays its part immediately in these practice experiments. The subject knows when he is doing well or ill. There is no difficulty in making the connection between the satisfaction or the discomfort and the bonds concerned, hence the effect is felt at its full strength. This condition is often not allowed for in school, — the child works at "something" but when it is just "something," the satisfyingness of the result cannot attach to anything very definitely. And besides, as has already been pointed out, it is too often true that the child is left in ignorance of the result, and therefore the law of effect plays no part.

Desire to improve. — A third very important factor in all improvement is that the idea of improvement itself must be prominent in the mind of the worker. It is not enough to have as an aim, to learn to add, or to toss balls, or to spell, but in each case it must be also to add faster than yesterday, to toss the ball oftener, or to have more words right, or learn them in a shorter time. Improvement in itself must be a conscious aim. Meumann[1] says, "the arousal of the will to improve is of fundamental significance in all mental and bodily improvement," and yet conditions are such that children in their learning seldom have more than a very indefinite feeling that, of course, they are supposed to do better; and this is true often because they do not know when they im-

[1] The Psychology of Learning, p. 362.

prove or how much. The change in the attainment of children in any given task is remarkable when conditions are so arranged that attention is focused on the improvement. For example, a sixth-grade class made tremendous improvement in their daily spelling when the teacher adopted the scheme of allowing them to represent the daily results in the form of a graph which was kept on one of the blackboards. It is not safe for teachers to think that children know when they improve. They do not, — even those in the upper grammar grades do not. Their standards of what is excellent are not clearly defined, and their power of analyzing their own work and comparing it with a standard is undeveloped. They need help along these very lines; and the only way to give it is to be sure that the amount of improvement, or the lack of it, is very clear in the child's mind.

Interest in work. — A fourth factor, which would seem hardly to need mentioning theoretically, yet which is still woefully neglected, is that of interest. Somehow or other, if improvement is to be steady the work must seem worth while to the child, it must satisfy some need of his, he must be interested in it. In the practice of the experimental laboratory this interest is present and helps to account for the results. Sometimes it is the novelty of the experiment that attracts, sometimes it is the desire to see how much one can do, sometimes it is the joy of beating some one else, and sometimes it is the realization that improvement along this line will materially aid in some work itself interesting; whatever the reason, the general rule is that improvement comes most rapidly when the whole of the child or subject is in the endeavor. It is almost pitiful when going into any classroom and starting one of these experiments, to see the vim and eagerness with which the children set to work. More of this same energy could be called upon in connection with the ordinary school work if some of the characteristics of the practice experiment were incorporated in it.

The practice curve. *Sharp slant at first.* — Two characteristics of the practice curve are important for students of child psychology, — the rapid rise at the beginning, and the presence of plateaus. It is true that the improvement at the beginning of any practice series is very rapid, and the newer the work the more rapid the improvement. Of course this means that children's gain at first in a new subject or phase of it is very marked. This is dangerous, in that it offers a temptation to go so fast in the learning process in the early stages that the material gained or the skill acquired is only just over the threshold of learning, is not fixed firmly enough to serve as a foundation for the next higher level of habits. The unwisdom of such procedure is shown in the unnecessary frequency and length of the plateaus which occur later. It is absolutely necessary for efficient and economical learning that the foundation be well laid, that the elementary habits be made automatic before the complex work that soon appears is attempted. Teachers must allow for and even encourage overlearning in the early stages if they wish to avoid the discouragement of the plateaus later.

What suggestions for teaching may we get from a study of the practice curve?

These *plateaus*, or places where there seems to be no progress, themselves offer a problem. They seem to depend chiefly on two conditions: first, the lack of automatization of elementary habits, which has already been mentioned; and second, the loss of interest. When one of these pauses in progress occurs it is highly necessary for the teacher to overcome it as soon as possible, for it is one of the most fruitful sources of discouragement. In order to overcome it the teacher must know to which of the above-mentioned causes it is due, for her method of dealing with it would vary as the cause. If it is due to lack of automatization, the cure would, of course, be found in review; the onward progress would have to cease for the time, and the old work be taken up once more from ever-varying points of view, with interesting

drills until the necessary automatism in response is acquired. On the other hand, if the pause is due to monotony and loss of interest, the cure might be found in an added spurt in the forward movement, or an entire cessation of the work for the time being, or in appealing to other interests, or in adding incentives. In any case, the method used would depend upon the cause of the plateaus. With adults it may be safe to leave the diagnosing of the trouble to the person concerned, but with children that certainly is impossible. They are probably not conscious of the lack of improvement, and they are certainly not capable of ascertaining the cause. This duty must rest on the teacher, and it is not an easy one by any means. The fact remains, however, that with care and alertness on her part, the number of these hindrances to steady improvement can be materially lessened, and the amount of time spent on the plateaus which do occur can be considerably diminished.

Muscular skill. — It has been pointed out by those who have investigated the acquisition and improvement of acts of skill when the responses are complex, that changes in method which are effective in bringing about improvement are at first hit upon unconsciously, but that their ultimate usefulness depends upon their being made conscious. This method of trying this and that in a blind effort to solve the situation is the animal method of learning, the simple trial and success method, and it seems to be fundamental and indispensable in all learning which involves physical skill. Explaining to a child how to do something is useless in the early stages; only after he has made the coördination, done the act in some fashion or other, has the telling any content for him at all. This suggests the need of much more experimentation method, much more " trial and success " in the learning of little children, and in the beginning stages of any learning involving muscular responses, even with adults. After the learner

How do the laws apply to habits of motor skill?

has attempted some responses by his own initiative, the suggestions of a teacher would be useful. True, if left to himself, he might in time stumble on a good method; but waiting for each learner to do so is not only lacking in economy, but runs the risk of forming bad habits. It is the business of the teacher to watch a child's endeavors, and at the opportune moment to suggest valuable changes in his method. Given in that way, suggestions are more likely to be effective, but given preceding any movements they are meaningless. The explanation to a child of the value of holding his pencil, or his needle, or his plane, or his bat just so, has no content for him until he has attempted to do it; the suggestion will then have an apperceptive basis, and the reasonableness of it is more likely to be clear by comparison. Teachers are too afraid to let children try things out for themselves. Of course, the danger of the bad effects of a wrong start must be guarded against by a close watchfulness; but trial and success with selection of the best variation of response is the only way to bring about effective and steady improvement.

Another fact in connection with this type of learning must be borne in mind. Although suggestions of change of method may be possible in the early stages, still a time comes when the act is so complete that words are meaningless; no one can tell how to improve. It must be left to the individual to stumble upon the necessary change, but the teacher can be of help in bringing the change to attention at once, instead of letting it pass perhaps to be lost, or at least with no greater chance of its occurring again rather than any other variation. There comes a time in swinging clubs when a certain suppleness is necessary to make the complicated swings go smoothly; in dancing, when an added element of ease must come if the slide is to be graceful; in singing when a fullness of tone is needed; and in painting when a certain lightness of touch conditions the smooth, even laying-on of the wash. No amount of telling how to hold the club or bend the wrist, of

how to hold the body or move the feet, of how to place the voice or open the throat, or of how to hold the brush, will bring the desired result. It must come of itself. But if a watchful teacher is there to say, " There now you have it, — that is the right quality of tone," " That is the swing you have been working for," attention is immediately attracted to the right response, and it is made more likely to reoccur because of the satisfyingness attached to the commendation.

IMPORTANCE OF HABITS. — There is no subject of child psychology more important than this one of habit-formation. All of life is dependent on habit, all of progress is conditioned by it. Lying at the root of all civilization, it is the bond that makes society stable, the element that gives character to the individual life, for character after all must be defined in terms of one's habitual modes of response. Since habit makes up so large a part of life surely no work can be more important for a teacher, for a school system, for any and all of the educational forces than that of making efficient the factor responsible for so much of the activities of the human race. The teacher's fundamental duty is that of habit-formation; for only so can she make possible the activities leading to independence and originality. This fact was pointed out in connection with memory, which is habit formation in the realm of mental states; but it needs to be emphasized again and again. Not too many habits, but too few is the danger that teachers must avoid. Having too few habits results in insufficiency of control, in lack of material, in narrowness of conduct and thought. The greater the number of good habits that an individual possesses in all fields, — thought, feeling, conduct, — the more efficient will he be, especially if among them is found the habit of forming new habits.

Exercises

1. Describe in physiological terms the risk of allowing exceptions when breaking an undesirable habit.

2. Why would it be poor training to have forty children take turns in being monitor for one day each?

3. What explains a small child's objection, "You're telling the story all different"?

4. Why are boys "willing to take the whipping if we can get the swim"?

5. Explain the unwisdom of assigning homework on a new principle in algebra before it is understood.

6. Should the strongest incentives be used at the beginning or at the plateau stage of a habit? Why?

7. What would be the value of definite lessons in table manners? How could they be planned so as to "form habits as they will be used"? In what ways does the high-school quick-lunch counter violate this precept?

8. In teaching children to sew, is it better to show them completed stitches on the material and pictures of the needle making the stitch, or to demonstrate by movement the way it is done? Why?

9. Should the resident or remote sensations be attended to first in forming a motor skill habit? When should the shift in attention be encouraged?

10. Observe first- and second-grade children while writing, and then illustrate each of these points made by James:

Habit saves time.

Habit simplifies movements.

Habit lessens fatigue.

Habit diminishes the constant attention with which the act is performed.

Habit makes movements more accurate.

11. Make a list of hygienic habits in the formation of which the teacher and home can coöperate.

12. How would you arrange to "reward good impulses" so as to have children form the habit of truth-telling?

13. What is the danger to a child, from the standpoint of habit-formation, of too early specializing in a vocation?

14. What means would you take, other than assigning school grades, to make progress aimed for and evident in such habits as: technique of piano-playing; looking for the topic of a lesson assign-

ment; careful observation in nature study work; the use of references, encyclopedias, Poole's index, etc.; outlining and summarizing?

15. Make a list of thirty or more specific, concrete directions you would give to replace the abstract one, "Be neat in your work about the laboratory."

16. What is the value to the teacher of thus analyzing a standard or an activity?

References for Reading

Rowe, *Habit Formation*, chs. 8, 9, 10, 11.
James, *Psychology*, ch. 4.
Strayer and Norsworthy, *How to Teach*, chs. 4, 14.

CHAPTER XII

PLAY

Why do children play?

One of the characteristics of children which seems perfectly obvious, and upon which every one agrees is the fact of their playfulness. Childhood is the playtime of life. Children seem quite willing to devote all their waking time and energy to play, provided this tendency has not been inhibited by some environmental condition. To play is as much a part of their original nature as to eat, or to sleep. Just what is the source in original nature has been discussed for years. Why do children play, and why do they play in just the ways they do? Several theories have been advanced, each containing something of value.

THEORIES OF PLAY. — One theory is that advanced by Schiller and Spencer. They claim that the excess energy of brain centers discharges into play activities. It is because the child has superabundance of energy that he plays. It is no doubt true that a well, healthy, rested child plays better than a sick, frail, tired one; but we know that both children and animals play when they are sick, and play until they are exhausted. What, then, constitutes "excess" of energy? This theory, also, does not account for the particular forms taken by play. There must be some reason for the fact that children between 7 and 8 enjoy "make-believe" games, and that between 9 and 11 the running games are so popular; and that the puzzle is fascinating at about 12, and games of skill of extraordinary interest in the teens. In other words,

there must be some reason for the fact that the play activities of children follow a certain order irrespective of environment, and this explanation the Spencer theory does not give.

The theory advanced by Professor Groos is that play is a **preparation for the business of life**. He thinks that in the various plays children practice the forms of activity that they will later need and upon which their struggle for existence may depend; that such practice is necessary for the future perfection of the various activities, and that development of the individual depends on it. No doubt in some instances, especially if one considers primitive man, there is some such correspondence; but in most cases the preparatory effect of the various games is hard to trace. For instance, it might seem valuable to children of uncivilized races to indulge as they do in the running, catching games, because the adult savage depends largely on his agility and strength for his existence; but for what do these plays prepare a civilized child? — For catching a street car perhaps, or getting out of the way of an automobile. The preparation, if there is one, must be taken in a very general sense, for no close correspondence can be found. Even if it does exist, as the theory suggests, it but indicates something further to be explained, for "Why does the child in his ignorance of adult needs react in just those ways which do thus train him? The explanation needs itself to be explained." [1]

Stanley Hall holds strongly to the **atavistic theory**, which is but a special application of the recapitulation theory. He says, " I regard play as the motor habits and spirit of the past of the race, persisting in the present, as rudimentary functions sometimes of and always akin to rudimentary organs. The best index and guide to the stated activities of adults in past ages is found in the instinctive, untaught and non-imitative plays of children which are the most spontaneous and exact

[1] A Comparative Study of the Play Activities of Adult Savages and Civilized Children, Appleton, p. 77.

expressions of their motor needs. . . . Thus we rehearse the activities of our ancestors, back we know not how far, and repeat their life work in summative and adumbrated ways." [1] The same criticisms of the recapitulation theory already discussed [2] will apply to this special application of it. Theoretically, scientists do not believe that human nature has undergone such definite and well-marked changes due to the stages of culture through which it has passed. Practically, it is difficult on this theory to explain why boys like to go swimming and to live in caves at the same age, or why it is that children enjoy playing with toy boats and trains before they want a bow and arrow, or why the favorite toy of most girls under nine is the doll. That there are common elements to be found in the plays of all children, whether civilized or primitive, there can be no question, but the explanation is probably not the one Dr. Hall supports.

Professor McDougall in his "Social Psychology," after reviewing the various theories of play, suggests that the essence of playful activity is found in the **motive of rivalry** or emulation. He says, " A motive that may coöperate with others in almost all games, and which among ourselves is seldom altogether lacking, is the desire to get the better of others, to emulate, to excel. This motive plays an important part, not only in games, but in many of the most serious activities of life, to which it gives an additional zest. . . . But wherever it enters in, it is recognized that it imparts something of a playful character to the activity." [3] But rivalry does not enter into many of the plays of children. Some plays, the make-believe plays, the doll plays, and the play of an infant are noticeably lacking in such an element. Moreover, the presence of rivalry when two individuals or corporations are fighting for the upper hand by no means changes their activity into a playful one. If carried out fully, this

[1] Hall, Youth, p. 74. [2] Chap. II, pp. 33, f.
[3] McDougall, Social Psychology, pp. 112–113.

suggestion would involve a differentiation of each instinct into two, — one the serious form, and the other the playful form which is always accompanied by the spirit of rivalry, and this does not seem to be true. It seems impossible, then, to take this theory as a full explanation of the play impulse, although of course it has an element of truth in it.

Miss Appleton, in her comparative study of play already referred to, advances a **biological theory** of play. She thinks that play is dependent on the structure of the body, and that the activity is of such character as will satisfy the needs of the growing body. " With the infant, the head or arm muscles being strongest, control the somatic type of play, together with the developing sense organs of the nervous system and the brain. Sensations, coming through the sheen of light, the shake of the rattle, the throwing of the ball, are his mental toys and his delight. Later, when stronger muscles co-operate in stronger and more complex movements and when further brain development makes perception and apperception possible, activity of the whole body is the somatic type, while mentally imagination, volition and imitation, become his toys. And so we hear, ' Tell me a story,' and see, a little later, the story epitomized in dramatic representation. . . . Is it not significant that whatever the type of play may be, it just keeps pace with the type of somatic growth? And does not the impulse to exercise these growing parts furnish all the explanation that is needed for the existence of the play activity? " [1]

This last theory seems to account for the facts better than any one of the others. In Chapter II it was shown how the instinctive tendencies to action, to feeling, and to thought were dependent on the development of certain connections in the nervous system, how this development always followed the same general order, how the readiness of the nervous system to act depended not only on its development, but upon

[1] Appleton, *op. cit.*, pp. 78–79.

the environment, the condition of the individual as to fatigue, comfort, etc., and the experience immediately preceding. It was also emphasized that in actual life, many responses might be ready at the same time, and that the situations calling out the responses are not simple one-to-one affairs, but extremely complex, often overlapping each other, so that at one minute one instinct might be the response, and at the next instant another.

MEANING OF TERM. — Bearing all these facts in mind, we see that so-called play resolves itself into the functioning of gradually ripening instincts evoked by situations not stamped with the economic need which would lead us to call the activity work. Given the same elements present in the nervous system but a primitive environment with its urgent physical needs, the probability is that the responses of action would not be called play because of the service they would render. As Thorndike says, "If infants from a year to three years of age lived in such a community as a human settlement seems likely to have been twenty-five thousand years ago, their restless examination of small objects would perhaps seem as utilitarian as their father's hunting." [1] In many, many instances, because of the protection and care of the parents, because of the difference between primitive and civilized society, because of the complexity of the environment, children respond in ways not immediately useful, and we say they play. For example, we call it playing when ten-year-olds have a pillow fight or a game of chase, when they model a snow-man or build a bridge or a dam across a small stream; but were the opponents really inimical, the plastic material clay, the country in danger of a flood we should consider the activities work. So, too, very small differences in the situation are sometimes big enough to call out different responses. A bottle given a hungry baby will stimulate the food-taking

When is an activity called play?

[1] Original Nature of Man, p. 146.

responses; given to the same baby when satisfied may stimulate manipulation and vocalization. In the latter case we should call it playing but not in the former; not that the baby has two sets of responses, one serious and the other playful, but that the slight difference in his physiological condition makes him respond in the first case so that we recognize the economic need, and in the second so that we do not. The need exists for the baby each time, but in different form.

Not one instinct, but a field for many. — If this is true, then there is no one specialized, isolated tendency we can call *the* play instinct with definite responses bound to definite situations; rather it should be regarded as the arousal of many instincts combined, depending on the readiness of the neurones, the general law of exercise and specially subject to the law of effect. In few cases, if any, does an instinct or tendency appear alone; several are " ready " at the same time and the action of each modifies the others. The law of readiness determines the kind of play engaged in at different periods. Thus, running and chasing is not a feature of play under eighteen months, nor dramatic representation under three years, nor competition under six or seven, nor intellectual games much before ten, nor social dancing with the other sex till about fifteen. Similarly, the rattle that pleases the baby is ignored later, the woolly lamb on wheels dragged down the street by the two-year-old would disgust the nine-year-old, the eight-year-old's doll no longer interests the fourteen-year-old. The law of exercise controls the tendencies so that experience and learning quickly modify what in the play or work was the outcome of original nature. The law of effect determines the length of time children will play; their persistence till skill is acquired in roller-skating, top-spinning, pitching ball, hopscotch and whatnot, above all, makes the occupation, for them, play rather than work.

Amusement, games, sports. — Several forms of enjoyment are included under the general name play. There is amuse-

ment, which presupposes a somewhat passive attitude on the part of the person enjoying: thus, we amuse children by showing them pictures, telling them stories, taking them to a conjurer's performance. Games are characterized sometimes by the use of dramatic imagination to a definite end, chiefly by the presence of rules of varying degrees of complexity, the element of competition, frequently by a limitation of the number who may participate. For example, we have games of charades, cross-tag, dominoes, going to Jerusalem, checkers, croquet, football, and the like. Sports rather connote athletics out of doors, often with contest against physical nature, such as swimming, boating, races, though it may mean games, such as polo, golf, or "indoor sports," such as volley ball. This terminology obviously overlaps to some extent; but with these subtracted, the term play is reserved for the free play of very young children, for random, unattended-to movements, such as the nervous occupation of a lecturer's hands, or for some activity less definitely organized and regulated than is a game, such as "playing" horse, Indian, dolls. There is no sharp line of division in the use of the terms.

What different sorts of activities are called play?

Play, work, and drudgery. — Of more significance is our thought of all forms of play as distinct from work or drudgery. The difference here is not primarily one of the kind of activity, but one of attitude. No given activity can arbitrarily be placed in either class. Listening to a concert, working problems in mathematics, sewing or painting, attending a reception, playing a game of whist, taking a walk, working in the garden, — any one of these may be work of the hardest kind to one person and the most delightful play to another. This difference in attitude is caused by the difference in certain characteristics of the activity. When the activity is considered as work, it is being engaged in, not for its own sake, but because of some result worth while, only to be reached by means of the given activity.

How does play differ from work?

The eye of the worker is fixed outside of the activity on the result beyond. When the activity seems play to the individual, the process itself seems worth while; he is concerned only with the activity, that in itself satisfies him. The same result may be obtained as in the former case, but it is not the most important thing to the one engaged in the activity. When it is work, the process is merely a means to a desirable end, but when it is play the two are fused, and the process with its result seem desirable. For example, the boys who were paid to clear the potato patch of potato bugs found it most disagreeable work at first, and did it only to secure the money or escape the punishment for disobedience, or both. But when the competition and make-believe elements were introduced by some bright spirit, and the potato bugs became pearls and each boy tried to get the largest collection, — then the money received in payment was no longer the largest factor, but the process itself became of absorbing interest.

The work attitude is brought about because the activity in question for some reason is not adapted to the individual's capacity at the moment it is indulged in. This lack of adaptation may be due to fatigue; often some occupation begun with zest becomes drudgery before it is completed because of the fatigue occasioned. A child who usually considers his gymnasium period as play may, because of the late hours of the night before, find it hard work. Lack of particular ability may be the cause of the lack of adaptation. Music, or art, or handwork, or athletics may always be work for certain children simply because they lack ability along these lines. Sometimes the lack of adaptation is due to the fact that the activity has been planned by an adult who has not taken into proper consideration the stage of development of the child. When this occurs, the activity being beyond his stage of development, calling for powers and tendencies not yet ripe, or, as is sometimes the case, calling for tendencies which have been left behind, the process satisfies no need

on the part of the child. The only motive he can have in the pursuance of it is to satisfy the adult from whom the initiative has come, who has planned the activity. Under these conditions it is impossible for the child to throw himself wholly into the task, his attention is divided between the process and the end, and divided attention is always accompanied by strain. Were the activity suited to the child, if it called out some developing instinct or power, the process and end would not be disparate but a logical whole, and the attention therefore of a unified, concentrated type.

To sum up, the attitude rather than the occupation determines whether a person is at play, work, or drudgery. Play means a feeling of freedom, presence or absence of a conscious purpose, enjoyment of the procedure for its own sake, a varied and rather wide range of activity, adaptation to ability and stage of development, immediate attention. Work means action directed by one's self or others, a conscious purpose in the result to be attained whether or not there is enjoyment of the procedure, a fairly narrow range and variety of activity, possible lack of complete adaptation to the individual, probably derived attention. Drudgery connotes that the work is imposed by another, that the purpose is forgotten or so remote as not to motivate — in any case the purpose is not within the present procedure — there is frequently much repetition of a narrow range of activity, probably little adaptation to the individual, most likely forced attention.

Of course, it is true that in life situations there is not the sharp distinction between play, work, and drudgery here suggested; but it is true that at the extremes we find these characteristics. Fully to enjoy some play entails work; to realize one's purpose in either work or play may involve some drudgery. Of immense value is the fact that children in their free, social play learn the necessity of work and sometimes put in a good deal of attentive, persevering effort to

achieve the desired end. For example, some little girls want to play tea party; but before they do they must wash the tea set, go out to pick some berries and lay the table. In another setting this might be work, but when felt as a necessary preparation to the play it is done with much of the play spirit. Some boys anxious to figure as the band in a military parade will carefully practice the technique of the mouth organ, drum, whistle, or other chosen noise-maker in a way that would rejoice the heart of a teacher. An artist needing a particular type of head for the model in his picture may spend weeks, perhaps, in search; but the joy of his art is such that much of the drudgery connected with the quest is lost in the satisfaction of the end to be gained.

Why should the play spirit prevail in the schoolroom?

SIGNIFICANCE OF THE PLAY SPIRIT. — It is because of this vital relationship between work and play that play has been called one of the greatest factors in education. It is the aim of educators to-day to take more of this same play spirit into the schoolroom. So to arrange the school work that much of it could be done in the play spirit would be a tremendous gain. So long as the school organization is as it is, and so long as civilized ideals hold sway, work and even drudgery must have a place in the education of every child, but when possible the play spirit must be encouraged, be planned for if results worth while educationally are to be obtained. For it must be remembered that the play spirit appears whenever activities are suited to the individual's capacity and stage of development, and in themselves satisfy a need.

In emphasizing the need of the play spirit in education two facts must be borne in mind. First, that the play spirit is not synonymous with the free physical activities of the child. It is much broader. It is not confined to any type of activity, nor to any age. It is characteristic of the intellectual responses just as truly as of the physical; imagina-

tion, observation, judgment, and reasoning are used in play. The constructive and æsthetic arts with their fusion of the physical, intellectual, and emotional factors are often characterized by the same spirit. In our thinking of play we have been prone to think of the earliest manifestations of it in the field of physical activity principally, and thereby have neglected the more important features. Any activity engaged in primarily for its own sake, which is in itself satisfying, is characterized by the play spirit. The second fact to be borne in mind is that play does not mean being amused, and it is not synonymous with aimlessness, and lack of results. Again, the error has been committed of taking the first immature manifestations to be the earnest for all. Think how much of time and energy a ten-year-old spends on his play, — how his resources of ingenuity, imitation, tact, judgment, perseverance, are all taxed. And think, too, of the results he gets, the ends he attains. And if the field of adult activity be examined, the conclusions must soon be reached that most of the results worth while to the world, whether in the field of industry, invention, science, art, philosophy, or social administration have been reached by men and women who were working in the play spirit. Great results can never be obtained when the individual with divided attention, with the initiative coming from another, is striving primarily for the remote ends of an activity. It is only when the activity grips him, when in it he sees value, when it satisfies a need of his nature that great, far-reaching results are possible. The great philosophers, teachers, artists, poets, musicians, inventors, — geniuses in any field of human endeavor, have all done their work in the play spirit. And this is the ideal of the school, and of all education; so to arrange things that the child, the youth, the adult may be able to a greater and greater extent to do his daily work in the play spirit.

AGE DIFFERENCES IN PLAY INTERESTS. — As the plays of children depend upon their developing instincts

and powers, changes in the plays must occur as these inborn tendencies wax and wane. The order of this development is away from mere physical and sensory activity towards that involving more of the intellectual factors; away from the individualistic towards the social and competitive. Besides this change in the forms used in play, there are other changes of equal importance. Imitation plays a larger and larger rôle. The instinctive basis of the plays of children under five is very evident, but that is not true of the older children. The form that the activities take, the particular plays or games used depends on the particular environment. Tradition and custom determine the plays of a locality. The elements due to original nature are only with difficulty discernible in the mass of elements that have been added through imitation. And yet it is interesting to note that the plays of children of about the same age, in widely different parts of the world, are alike in the essential characteristics, due of course to the part played by original nature. Another change which takes place is in the complexity of the activity. The early plays are comparatively simple, but as the child grows older and the number of inborn tendencies increase, overlap, and merge, the plays are correspondingly complex. This change results in greater organization and the plays become games, with rules which must be carried out by all the participants. The increasing complexity and organization of the plays necessitate the introduction of elements of work within the activity as means to an end.

Which kinds of play are enjoyed at different ages?

Roughly, the kinds of play enjoyed at different ages are as follows: during infancy sensory and perceptual plays predominate, with the developing tendencies to general physical activity, locomotion, manipulation, and vocalization. The responses are crude and, at first, seem almost the result of random movements. Before seven, children engage in play rather than play games; it is preëminently the toy age,

with imitation and imagination as new developing factors. From seven to ten play is decreasingly solitary, increasingly competitive, involving much physical exercise such as running, jumping, throwing, hitting, climbing, also quieter manipulation, more sustained group dramatization, collecting and hoarding. From ten to twelve or so the greatest variety of games is played; for to the tendencies already functioning is added more general mental activity helped out by wider information, shown in guessing games, wider reading, the interest in language. Abilities are developed by rivalry in ball play, swimming, construction work, jumping the rope, doll-dressmaking, the use of words and the like, while there is an added love of more passive movements such as swinging. The rise of the gang spirit, inciting to greater possibilities of adventure, is one of the most important tendencies of this pubescent age. In the teens, both McGhee and Croswell[1] show that doll play, chasing, imitative and mere make-believe games decline, whereas rivalry, teamwork, games of chance, rhythmic movement, athletics of all sorts gain in favor. Now is the time of highly organized activity, and of the elimination of many earlier forms of imaginative play. Adolescent boys are more fond of running games than are girls, specialize on fewer, organize better, play intellectual games, and games of chance less.

This description is clearly inadequate as an analysis of the tendencies which show themselves in the playful activities of any period. This inadequacy is unavoidable from the very nature of the case. The fact that the tendencies themselves are so complex, that they do not act independently, that the action of each one affects all the others, that they vary as elements and conditions in the situations vary, and that the environment affects so materially the action of all tendencies, — all these conditions make a clear-cut, simple analysis of the plays of various ages impossible. All that a

[1] Ped. Sem., Vol. 6, p. 314. Ped. Sem., Vol. 7, p. 459.

student of children can do is to point out the general line of progress of activities that are playful due to the gradual development of the innate tendencies from those that are primarily sensory, physical, individual, purposeless, and unorganized, to those that are primarily intellectual or emotional, and social, and in which purpose and organization play a much larger part. The change from level to level is a very gradual one, and the difference is not so much in the incorporation of new elements as in the change of emphasis on those already present.

The educational value of the free play of children increases as these changes take place. In their play children learn to observe quickly, to judge, to weigh values, to pick out essentials, to give close attention; they learn the value of coöperation, to recognize the rights of others as well as to insist on their own being recognized; they learn the meaning of freedom through law; they learn the value and function of work and the joy of accomplishment. No wonder that play is regarded by many as the most important educational factor of them all. A child who does not play not only misses much of the joy of childhood, but he can never be a fully developed adult. He will lack in many of the qualities most worth while because many of the avenues of growth were unused and neglected during the most plastic period of his life.

In what way can play be supervised?

DIRECTED PLAY. **Provision of space**. — It is because to-day educators are more alive than ever before to the need of play that the movements for playgrounds in the cities and for supervised play everywhere are so widespread. Although it is almost impossible to inhibit all phases of play, still lack of facilities will inhibit certain phases. Plays that are largely physical, which include running, chasing, throwing, jumping, swinging, as well as the various ball games need space in which to be played. Crowded city streets offer no inducements and the law forbids their use as playgrounds. Consequently the bodies of

children in most slum districts suffer for want of legitimate exercise. Plays which involve numbers, which necessitate group work and team work, also need space. Lacking a place for such games the characters and mental alertness of children suffer. The opportunities for the development of honesty, of generosity, of coöperation, of sacrificing individual pleasure for the good of the majority are lessened; all these and many more of the characteristics most worth while in adults are poorly developed, simply because the children did not have a place to play. Opportunities in the way of playgrounds more or less well equipped are absolutely necessary for the rich development of childhood. Later on, it is equally important that youth should learn the use of the school buildings, club rooms, etc. Play does not cease with childhood though the character of it changes. Opportunities for the development in the playful spirit of the higher intellectual and emotional factors must be provided if we are to make use of all that nature has supplied.

Supervision, wise and unwise. — Supervision and direction of play offer another opportunity although of a different character. Not only must there be nothing to inhibit the development of an inborn tendency, but often such a tendency needs stimulating. The wise guidance and suggestion of an adult will often furnish opportunities which the children, if left to themselves, would never have discovered. Such supervision will also conserve the nature of individual children, in some cases protecting them from themselves, in others encouraging them to fresh endeavors. The social, intellectual, and moral elements are more likely to be stressed and encouraged if there is supervision than otherwise. The children are not allowed to play on a lower level of development when they are ready for a higher. The possibility of work in play is made much of, although the relative value of the two is emphasized. Wise supervision, of course, does not force but only suggests and encourages.

Valuable as supervision is, not all play should be supervised. Complete freedom is handicapped by the presence of an adult. When play is supervised there are some serious dangers which must be avoided if it is to be a truly educational factor. All these dangers grow out of the fact that adults do not in the first place fully understand the nature and value of play, or in the second place do not study closely enough the stage of development of the children they are supervising. As a result, it is often the case that the teacher or supervisor introduces plays for which the children are not ready. It is a question whether the kindergarten has not erred in insisting on so many group games at a time when the child's interest is so predominantly individualistic. The reverse of this is true in the primary classes, and the question is whether the primary school has offered enough opportunity for the development of the group game. It is difficult for the supervisor not to emphasize the intellectual factors along the line, and all ages of children are not equally ready for that phase of play. Another danger is that the supervisor will push the complex, organized game before the children are ready for it. The simple plays, without many rules, quickly played and easily changed, must come first. Perhaps the greatest danger of all in supervised play is that the initiative will come from the adult instead of from the child. When this is true, even though children seek the direction and guidance, one of the greatest values of play is gone. The initiative, the motive force must come from the children if their play is to them really natural. When there is too much direction the essential character of the activity may be changed for the children, and what in form is play may be work; when this happens, the value of both play and work is diminished. The very fact that the supervisor or teacher is an adult, and that the players are children, makes educative supervision very difficult. Adults must efface themselves more, they must play the rôle of observers more effectively,

the doctrine of "hands off" must be applied more often in dealing with children both in their work and in their play if they are to reap the full benefit of their activity.

Exercises

1. Make out a list of fifty or sixty games and plays you enjoyed from as far back as you can remember. Classify them according to

(*a*) the age at which you played them,
(*b*) whether it was mostly a game or play,
(*c*) whether there was rhythm,
(*d*) whether there was repetition,
(*e*) whether there was competition,
(*f*) whether there was imagination,
(*g*) whether there was much language, or intellectual feature involved,
(*h*) the type of organization, was it individual play, in an undefined group, a double group, a pair or double pair, or an organized group.

Arrange your classifications in tabular form on one sheet. How does your introspection corroborate facts brought out in this chapter?

2. Observe the neighborhood closely for about a quarter of a mile square in a city, more in the suburbs or country. Enumerate the facilities and conditions for play such as, (*a*) space; (*b*) topography, including slopes, gutters, vacant lots, sand, clay or rock, trees and grass, steps, area railings, low walls, etc.; (*c*) physical safety, such as conditions after dark, amount of traffic, street railways; (*d*) moral suggestions, such as number of saloons, churches, libraries, moving-picture theaters, overcrowded living conditions; (*e*) points of interest to children, such as toy and candy stores, fire engine house, garages, fire hydrants, building going on, exposed fruit stalls, etc.

Make a map, if time allows, and enter these features.

3. In the neighborhood you surveyed, spend from three to six hours observing the children at play at different times of day. Note (*a*) the name of the activity, (*b*) approximate age, (*c*) size and sex of group, also the points as given from (*b*) to (*h*) inclusive

in exercise 1 above. Tabulate as before. How do the results compare with your answer to 1?

4. Visit a large toy-store during its pre-Christmas display. List such articles as you would advise parents to get for children under three, under seven, seven to ten, ten to thirteen, in the early teens.

Questions for Discussion

1. What does a teacher mean by saying "Stop playing now, and get to work," or "You haven't worked at this, you've only played"?
2. Is following a hobby play or work? Why?
3. Describe and illustrate the attention characterizing play, drudgery.
4. How would you bring the play spirit into a task children are likely to consider drudgery?
5. Is work, in and of itself, developmental?
6. In what respects does the play of Japanese, Dutch, Hindu, and American children differ?
7. What should a teacher gain from careful observation of the unsupervised play of her particular group of children?
8. Did you, as a child, prefer the perfected mechanical toy or the "do with" variety? Why?
9. Illustrate the facts that tradition, the season, and sex make a difference in the kinds of play engaged in.

References for Reading

Lee, *Play in Education.*
G. W. Johnson, *Education by Plays and Games.*
J. Addams, *The Spirit of Youth and the City Streets.*
G. Stanley Hall, *Youth*, ch. 6.

CHAPTER XIII

SEQUENT TENDENCIES. MORAL AND RELIGIOUS DEVELOPMENT

What are the essentials of morality?

DEFINITION OF MORAL TENDENCY. — Of the many current definitions of morality perhaps one of the most significant is that which calls it the *intelligent choice by the individual of habits of action for the good of the group.*

Intelligence a factor. — It should be noticed that at least five things are involved in this conception. *Intelligence* implies that an individual, to be moral, must know the accepted standards of right and wrong. On this account the very young child or a feeble-minded person is obviously not moral. The first needs instruction, the second may not be able to profit by it. So, too, from the stranger in a community, be he newly arrived immigrant, freshman at college, pupil in a new school, or rural visitor in a city home, breaches of social customs are tacitly ignored while the newcomer is allowed a period in which to shed his greenness. No plea of ignorance of the law is sufficient, however, to enable the adult citizen to escape the penalties of breaking it. Training in morality will include then (1) instruction in desired standards, (2) the formation of ideas of right and wrong by empirical means.

Personal choice. — A second constituent of morality is *personal choice.* This involves a motive and a decision rather than a blind keeping of the law. A hypnotized subject or a sick patient are extreme cases of people whose actions may be

conformable to law but who entirely lack individual motivation and impulse. Their outward conformity is therefore not moral. In this matter we should not make the mistake of supposing that a routine compliance with orders on the part of any one, together with an absence of thoughtful decision or purposeful control of emotions, is moral. Our complaisant adult conduct is, however, largely of this type. Most of us have not *chosen* to refrain from murder, theft, arson, and the like; we have simply not had the occasion for such conduct arise opportunely. In fact, were such occasion now to present itself, especially without a strong emotional setting or appeal to an instinct, we should probably refrain, not from any moral choice, but from sheer inertia with regard to a non-habitual line of action. Our law-abidingness, then, has never risen to the moral level with respect to these and many similar things; it is merely non-moral. Not that this neutral, non-moral conduct is valueless: quite the contrary, it has its main social utility in that it constitutes a stabilizing force helping to conserve standards, restrain or support the weaker ones among us, and provide the stepping stone to higher levels. As individual preparation for dealing with new situations, however, especially in moments of strong emotional urge, it is dangerous in its narrowness. Training, then, must provide opportunities to reason and to choose in matters of right and wrong conduct, or else children cannot learn independence of will nor acquire clear vision of ethical values.

Individual responsibility. — The third requisite in morality is to have *responsibility* thrown upon the *individual*. Each must stand accountable for his own deeds, learn his standards, do his own choosing. In this matter no moral person may shelter behind the community as a whole, nor behind any other person in the guise of counselor or friend, nor behind any institution. Each, as he comes to years of discretion and elects to whatsoever small unit of society such as club, political party, church, profession he will give his adherence, by

thus pledging his loyalty, takes a definitely moral stand, and shares the responsibility for the good of that unit and for its value to the larger social group of which it is a part. Should his greater intelligence show him ways in which his unit is running counter to the general social good or is failing to further it, it devolves upon him to point out that fact and to help make such changes in policy and function as will carry his vision into reality. Should a person have charge of others, the morals of leadership imply that he look out for the well-being and the well-doing of his followers; in that case he must expect blame or praise for others' acts as well as for his own. Moral education will have to include (1) the refraining, on the part of adults, from giving directions or advice too freely, (2) the intrusting of special commissions to children, (3) positions of command and care of others.

Habituated action. — The fourth fundamental in morality is *action*. In fact morality is in its very essence, action, and, moreover, *habits* of action rather than isolated acts. Too often a person prides himself, not only on the things he doesn't do, but on the beautiful sentiments or the fine ideas he has either in the abstract or those which criticize other people's conduct. But ideas and sentiments without expression other than in words whether oral or in print do not begin to give us morality any more than steam from the spout of the kettle will accomplish anything; both have to be directed, transformed into working power. A quite limited intelligence backed by earnest effort may produce a constructively moral character provided the individual lives out the best that he knows. But to have the knowledge, the vision, and to fail in living up to it — to have the power and the insight and to neglect to use them for the social good, is more than the negative act of a shirker. It is as positively immoral deliberately to refrain from a recognized good as it is to go and poison one's neighbor, a truth we have frequently heard proclaimed and at last are beginning to realize.

Further, an occasional moral act does not make a man moral or the reverse. Character is composed of fixed tendencies or habits rather than of spasmodic deeds. A woman who has once refrained from slandering her neighbor is not thereby virtuous any more than the youth who has taken one drink of whisky is an alcoholic. Perhaps our thinking is not yet sufficiently clear on this point, for we unfortunately are apt to condemn a girl permanently for one lapse from chastity, and to condone all a wastrel's offenses for one act of bravery. Particularly should we be cautious in passing judgment as final on characters still in the making, of penalizing an adolescent for a few misdeeds, or of affixing derogatory adjectives as labels on to the persons of immature human beings in consequence of single immoral acts. Likewise, we should not rest content with instilling moral precepts, nor with hearing professions of idealism, nor with supervising a few performances of moral acts. We must enlist the children's coöperation in the long process of habit-forming with all that that means in the way of perseverance, provision of extra chances to practice the virtue, and eternal vigilance against exceptions.

Social relationship. — The fifth constituent of morality, already touched on, is that action shall be *for the social good.* Not all conduct, then, has a moral bearing; but no conduct which has a social effect either immediately or more remotely can escape being either moral or immoral. To overeat, to sit up constantly till 1 A.M., to invite injury through negligence while engaging in sports may be, at first blush, a purely individual matter and non-moral; but in so far as they impair the efficiency of one's services to society such acts are immoral. Clearly too, habitual indulgence in actions having a deleterious effect upon one's work is more immoral than is any single act; likewise a deliberate repetition of conduct realized as having a harmful consequence is worse than a chance repetition. Training in morality will include observation of the effect of others' actions on one's self, so that by application of the

Golden Rule only such actions will be chosen as have a desirable effect on others.

Historic changes. — The term "social good" must be taken in a relative sense, however. Standards of good differ first of all with the age in which one lives and the degree of civilization reached. To eat one's enemy, to kill one's aged grandparent, to burn a heretic alive are no longer considered moral acts though they all were permissible at one time or another. At present we are convinced that dueling and slave-holding are not for the social good, and are in the early stages of realizing that sweat-shop conditions, the holding of food monopolies, and the advertising of quack medicines are likewise immoral. To-day we feel that actions reaching the mental or spiritual life are more influential morally than those touching merely the physical. Thus, treachery is less easily forgiven than is a murder committed in a lust of rage. Suggestively vicious moving pictures are worse for the adolescents of a community than is negligence resulting in a typhoid epidemic.

Racial differences. — Racial and national differences in moral standards also exist. Hatred of lying, ideas of honor, reverence for the old or weak, for instance, are not the same among Chinese, Scotch, and Italians; marriage and divorce laws are different in England, Turkey, Japan, and various parts of America.

Size of group. — The relativity of moral standards depends not only on the age and nation in which one lives but upon the size of the community one considers. An act non-moral for an individual in a small family becomes immoral for any one living with two hundred others in an institution. A single family living isolated on a mountain may dispose of its garbage, sewage, and waste in any way it chooses; not so the family living in a small town. The town may use a near-by stream for sewage disposal, but not the city situated upstream from another city. Only recently, however, have we begun to suspect that if it is immoral for an individual to lie, steal,

and murder, it is also immoral for a corporation, a society, a nation, to do these things. Our social horizons and our estimates of what is moral widen and stretch together. Moral training will necessitate, therefore, introducing children into wider and wider social environments, as well as instructing them, presenting opportunities for choice, throwing increasing responsibility on them, and insisting on actions being coordinated into habits.

Distinction from immorality. — If morality consists in these things, then to be an ignorant follower, or to live in isolation may leave one non-moral; but to know right and wrong and choose the wrong, or to choose in thought merely and refrain from doing the right, to habituate conduct by a narrow gauge only makes one immoral. What can be said of those who can think, but carelessly don't consider the maximum social good? Or who think but stop short of decision? Or who have ability but shirk responsibility? In these matters perhaps most of us have not "done growing." *What is immorality?*

Dependence on instinct. — To the question whether there is a single instinct that could be called *the* moral instinct the answer surely is that there is not. Morality is certainly acquired. Many instincts contribute to its growth; innate tendencies that are primarily social soon become modified by contact with other human beings, emotions are gradually controlled and utilized in one way or another, but all this is a process of learning. Little children find that certain impulses that tend to further individual satisfaction come into conflict with other impulses which tend to further the good of the group, — the family, the playmates, the working unit; thus occasions are provided for choice and inhibition of one set of impulses rather than the other. Whether children become moral or immoral depends upon the way in which their original tendencies are modified. Their "conscience" is the outcome of education in a community and will, of necessity, reflect its standards; but the concepts *Is morality innate?*

and ideals are only gradually formed as their knowledge and experience is extended.

Questions for Discussion

1. What moral responsibility is involved after you have realized such things as the following: (*a*) that a large class passes more easily from a room if the movable seats and book-rests are turned back and the doors opened wide? (*b*) that to spit is unsanitary? (*c*) that a station platform is dangerously narrow for the crowds that use it? (*d*) that obscene picture postals are being sold near your school? (*e*) that you are over-working?

2. Under what circumstances is it non-moral or immoral to (*a*) drop candy-wrappings, fruit skins, nut-shells, etc., wherever one is eating? (*b*) to conceal the fact that one has tuberculosis? (*c*) to delay decision in a plan of action? (*d*) to read novels or do nothing every afternoon for a month?

3. Are these things moral or otherwise? (*a*) total abstinence from alcoholic drinks, (*b*) loyalty in a partisan way to such things as "the gang," a secret society in high school, (*c*) ignorance of the civic health regulations.

4. What do your answers to the preceding three questions suggest as to requisites in the moral training of children?

5. In what way is a child brought up alone likely to be deficient morally? Why?

6. In what ways is "self-government" among a class of fifth grade children of approximately the same age unnatural?

RELIGIOUS TENDENCY. — Meaning of the term religion. Religion is harder to define than is morality. Menzies calls it " the worship of unseen powers from a sense of need." Stratton says " one might say that religion is an appreciation of an unseen world, usually an unseen company." James puts it, " We and God have business with each other, and in opening ourselves to His influence our deepest destiny is fulfilled. . . . In the sober moments of life every man instinctively appeals to or leans upon the larger and stronger spirit whom he, perhaps vaguely,

What is implied in the term " religion " ?

regards as the original and final authority over the affairs of men." [1] Religion is not to be identified with the performance of many acts of public and private worship, nor with the possession of information about religious literature, history, and theology, nor with susceptibility to emotional transports, though in the popular mind the term " a religious person " may easily call up a mental image of an adept in any one of these three lines. It is true that religion does involve acts, knowledge, and feelings, since religion is a way of living. Its peculiarity as a way of living is in its point of reference to some power or powers other than human with which man has some kind of relationship. It will be seen that roughly this description fits the Moslem, the witch doctor, the Parsee, the Presbyterian, the modern Japanese, the Jew, the Hindu, the Quaker, the Catholic, and many other types equally well. Coe says, " Religion exists at all because men find themselves and their world standing over against each other in an antithesis, even opposition, that needs to be resolved. . . . The religious impulse is thus toward the progressive unification of the man with himself, his fellows, nature and all that is. It is man's effort to be at home in his world and with himself." [2] Religion, then, is the unification of life in terms of principles which prove themselves true. It is the regulation of life by ideals of universal and everlasting truth. It is the attempt of the human being to live the best that is in him, to be the best that he can ; and that attempt comes only through communion with the Infinite. To live as children of God is man's highest realization of self, and it is the essence of religion.

The expressive formal *acts* universally recognized as religious include seclusion for purposes of meditation and introspection, fasting, the need of objective symbolic objects, self-torture, burial customs, collecting of sacred literature, pubic initiations, pilgrimage, prayer of all types from mere incanta-

[1] Varieties of Religious Experience.

[2] Coe, Education in Religion and Morals, pp. 200–201.

tions up to friendly communion, sacrifice, concerted worship including the use of music, fasting, dancing, various rites and ceremonies.

On the *emotional* side we have the feelings of fear, wonder, awe, reverence, sense of mystery, filial relationship, gratitude, fellowship, assurance of safety, peace and love, sympathy for suffering, enthusiasm for living for a cause.

On the *intellectual* side the instinct shows itself in a consciousness of increasing uneasiness, a realization of a gap between what is and the ideal. This duality, disturbance, opposition, is resolved as salvation from wrong by the deliberate connection with the higher: the Ideal beyond limitations is postulated as the only Real. The self is identified with this higher Ideal, which in turn is probably identified with the force operating in the universe at large. All feel that this force exists and functions, though the various religions and theologies may differ in their belief of the nature of this force and the way in which it acts. The first idea of God may arise from observation of the forces of nature, in other words animism. Belief in the immortality of spirits is the next stage, with its accompaniments of ancestor worship, superstitions, fetichism, incantations, and magic. Local and tribal deities are adopted, then national deities with assigned seasons and places of worship. As the tribal god inspires to loyalty, so the national god inspires to righteousness. From a zoömorphic conception man passes through polytheism, an anthropomorphic conception, symbolic presentation to a philosophic concept as Final Cause or as Power making for righteousness. This brief survey of religious tendencies gives some indication of how we might expect children to develop if left unguided.

Essentials. — 1. To be religious requires, first, that the individual, through *experience*, realize the inadequacy of various endeavors; the lack of adjustment between man and man; the warfare within himself between a better and a worse

self; the need to explain and account for nature. Religious instruction, which is mere telling, giving information, will not meet this need. Religion, the progressive and the final adjustment, is Life, and Life means action. The feeling of maladjustment must arise from actual living, not from mere head-knowledge, otherwise the individual may be non-religious but he could never be truly religious. The value of law, the need of human sympathy, the meaning of divine love, the function of punishment, the dependence of the individual upon others and upon unseen, often unknown, forces,—all these facts and many others must come to the child growing up in human communities. Too much protection and care often prevents wholesome experience. Dogma and creeds are accepted when not understood, and the normal questioning and investigation that would have led to a true realization of some of life's problems, are snuffed out.

What are the essentials in religion?

Realization of opposing forces. — 2. With the realization of the inadequacy of responses along the lines indicated, there must be present a desire to make things "better," to have things what they are not. In other words, there must be ideals — ideals real, vital, ideals that can influence conduct. Of course they will vary with the maturity and surroundings of the individual. From childish ideals and principles such as of being "Papa's brave boy," and of "God who is just like a big Santa Claus who wants me to be good"; or of explaining thunder storms by saying "God is rolling barrels"; or of sharing with sister because she shared with me yesterday, we progress to these ideals of living as taught and lived by Christ, and to the laws of nature and society as evolved by science.

Habits, knowledge, and thinking. — 3. As in morality, knowledge, thinking, and habits are all necessary and for the same reasons as there discussed. Since religion is a matter of constant, steady living towards an end, habit must control. Real

control involves thinking, and without knowledge thinking goes astray and some habits cannot be formed. Further, unless religion is the outgrowth of judgment, of choice, it is blind, — not rational, — it does not take in the whole man, and therefore is not true religion.

Religion includes morality. — From this it will be seen that religion, in its true and biggest sense, includes morals. A man cannot seek to unify life in accord with ideal ends without working with that phase of it which requires the adjustment of man to man, which we mean by the term " morality." It is hard to see how a man could be really religious, and yet be immoral. On the other hand, it is possible for a man to be truly moral without being fully religious. He may unify his experiences in regard to his fellow creatures under moral laws; but he has taken into consideration only one phase of life, he has not reconciled the opposing forces along other lines, and therefore is not religious. Morality, included in religion, is a stepping stone to it, but morality is not religion. Religion is Life at its broadest and best. It is man finding himself in God. This ideal requires every power of the human being to think, to feel, and to do; all are required in this greatest problem of the human race.

Connection with instincts. — As in the case with morals, the question as to whether or not man is naturally religious has been hotly debated; it is far from settled yet, perhaps less settled even than the other question. That some of the other instincts contribute to the development of religion cannot be doubted. Some of the most important are curiosity, the sex instinct, the æsthetic instinct and fear; kindliness, gregariousness, satisfiers and annoyers, love of being a cause, all help, in fact, the last named tendency in its subtle responses in the secondary connections is a large factor. It is probably responsible for the power to idealize, and therefore for the power to think of a God. The fact that such activity in these secondary connections is satis-

Is there an original root of religion?

fying makes man want to improve his conduct, make it measure up; for that element is an intrinsic part of every ideal. The working together of our experiences, and the instinctive responses from which in time evolves the consciousness of a separate and distinct personality are also large factors in developing religion. Without an independent personality there could be no religion. This much practically all students of child psychology would grant. However, some of our scholars will go further. Coe says,[1] "Man has a religious nature. The definite establishment of this proposition is perhaps the greatest service that the history and psychology of religion have performed." "To speak positively, the possession of a positive religious nature implies three things: (*a*) that a child has more than a passive capacity for spiritual things. . . . A positive spiritual nature goes forth spontaneously in search of God. (*b*) That nothing short of union with God can really bring a human being to himself. . . . Failing to find Him we lose even our self. (*c*) That the successive phases in the growth of the child personality may be, and normally are, so many phases of the growing consciousness of the divine meaning of life."

Need of training.—Whether we agree with the foregoing statement or not there can be no doubt that in original nature somehow or other are formed the roots from which religion develops. It may be that religion is the result of the working together of various subtle tendencies in the secondary connections, such as Dr. Coe's explanation suggests; or it may be that as the main taproot of morality is formed in the instincts of kindliness and self-gratification, so the taproots of religious nature will be found to be goodliness and self-gratification. The main thing for us as students of child psychology to bear in mind is that children have a religious nature. To ignore it is to deprive them of some of their inheritance, — after all, the most

Is there any need to train and develop the religious impulse?

[1] Coe, *op. cit.*, pp. 37, 62.

important part. But the fact that children have by original nature a religious impulse, is no reason to suppose that they will grow up religious, or that they will necessarily have any conscious religious experience or realization of God. This tendency needs developing, pruning, directing, feeding, just as any other does. All children have the kindly instinct, yet how many brutes there are, and how many more who are never rationally moral. We all have the instinct of curiosity, yet how few of us become scientists. Much and careful training is necessary before a child grows up into a truly religious adult.

Questions for Thought and Discussion

1. What evidence can you get, by introspective recall or by observation concerning children's ideas of God, which might support the culture epoch theory?

2. Did you ever invent a god, an idol, or a ritual of your own? If so, at what age? Have you known of this in other children?

3. Comparing several religions, what instances can you give of the sex instinct being controlled or sublimated by religious emotion, or of religious rites and practices degenerating into sexual orgies? What possibilities does this suggest for the training of adolescents?

4. At what ages, if any, have you felt in yourself or seen in others impulses to improvise sacrifices, to institute some form of blood covenant, to use self-torture, to indulge in a dreamy mysticism, to start out to reform the world, to overestimate the use of symbols, to organize a philanthropic cult or society?

TRAINING IN MORALS AND RELIGION. Principles concerned. — As has been shown, there are various essentials involved in religion and morals. A way of living to include relationships with a higher being and with one's fellows implies the development of the intellectual, volitional, and emotional aspects of children's natures. They must be informed, they must think, they must choose, they must gain independence

What psychological laws are involved in moral education?

of thought and choice, they must be inspired and motivated, they must act, and act consistently. The self must be oriented with regard to other human beings and the higher powers. Since there is no one thing recognizable as *the* moral or *the* religious instinct, but simply the whole self employed about moral and spiritual matters, and as education is a unitary and continuous process, it follows that there is no special education to be termed moral or religious; it is merely one aspect of the whole. Its material may vary slightly but scarcely its methods, since it deals with the same highly complex organism of feelings, affection, impulses, aspirations, habits, and intellectual capacities as do other aspects of education. No new psychological laws are needed, therefore. However, since we are conscious that many adults remain on low moral levels in all sorts of ways due to defective training or inadequate environment, it may not be amiss to emphasize a few of the most important factors in the development of children during the non-moral and transition periods.

Laws involved are not new. — First. It must be continually and forcibly emphasized that the same laws do apply in the development of moral and religious responses that apply in the development of any other type. Most people even to-day, if one can judge from observing the training of children in these fields, believe that some mysterious force reigns here, and that although every law of child psychology and every law of teaching be broken, yet faith and prayer will make children both moral and religious. Witness the subject matter, the methods, the material used in the majority of our religious schools, Jewish, Catholic, and Protestant, save the few progressive ones. Where is the motivation, the interest, the provision for initiative and motor expression which are considered so important in the secular schools? How many of the teachers who serve Sunday after Sunday would be tolerated in a day school? How many parents who declare their inability to teach their children arithmetic or history

yet do not question for a moment their ability to teach them to be moral, God-fearing men and women? The fact is that instead of being easy, this problem is one of the most difficult of child education, because of its complexity. It is surely one of the most important, because the effect of training and environment is more influential here than in the field of intellect. Parents are, to a large extent, responsible for a child's character because it is the result of his environment, whereas his intellect is a result of heredity over which they have less control. In the field of morals and religion perhaps more than in others we need to apply our scientific knowledge of the development of the child. We need further to apply all our methods and principles of good teaching. We need continually to bear in mind that this field is in no way innately different from others, for it involves all others and is involved in every other.

Second, the existence of the *law of apperception* is often overlooked entirely in planning for a child's education in religion and morals. When this law is ignored, teaching is futile, no matter what the field. Here, just as in every other phase of child development, progress is gradual, and is limited by the content of the child's experience. It must be from known to unknown — the unknown interpreted in terms of the known, here as elsewhere. A child's maturity, his experience, his interests and ideals, his habits, his knowledge determine his growth and interpretation in religion and morals just as surely as they do in arithmetic or literature. Why, because adults enjoy thinking of children as little lambs, should the self-respect of a twelve-year-old be injured by having him join in singing a request to be made a lamb? Or, for the same reason, why should six-year-olds be compelled to memorize the twenty-third psalm with its unfamiliar metaphors and mature experience? Again, to appeal to motives of abstract right in Sunday School is no more effective than to appeal to those same motives in day school. To expect a

child to be governed by moral abstractions, or to appreciate them, when his advancement in science is still in the nature study stage, and in arithmetic he is still using apples and pencils and boards, is silly. And yet in our choice of subject matter that is just what has happened over and over again in these departments. The teachings of the fourth gospel, the Beatitudes, in fact, much of Pauline theology has been made the subject matter of Sunday School lessons for children in the primary and junior departments. This material embodies the highest moral and religious ideals of the adults of a highly intellectual people. It contains much more than many mature minds can grasp; how then is it possible for children to get anything from it save misconceptions? Such abstractions and ideals must grow gradually from knowledge and experience. To be shocked when a little child tries to bargain with God, — "if God will give me a pony, I will be a good boy," is simply to show complete misunderstanding of child nature. God, religion, other people, — are simply for the child's own use and pleasure, at first. His attitude is the same towards all his world. To put adult prayers and purposes into a child's life before he can possibly appreciate or understand them — when his general life is quite contrary to them — is useless, even dangerous.

On the other hand, why confine a ten-year-old to nothing but stories when in his fifth grade day-school work he has been introduced to so much more? And why omit the character studies, debates, literary criticisms, historical outlines for the sixteen-year-old when they are so familiar a feature of high school study? To fail to go on to the unknown, to stay with the known to the point of nauseating boredom, is no way to use the law of apperception. Again, what a foolish procedure it is in the treatment of morally delinquent adolescents, who of all others need special training, to subject them to the constant direction due the five-year-old, or to such rigid "military discipline," in isolation from the other sex, that they never

get the privilege of choice nor the empirical consideration of group needs that normal life in the teens brings. In religious and moral matters, as elsewhere, dependence on growth and experience must be the guiding principle in planning a child's education.

Third, the important place occupied by *suggestion* in this field of moral and religious training should not be forgotten. The human personalities surrounding a child are the chief source of the suggestions which to such a large extent influence his habits and mold his ideals. The baby by reflex imitation shares the moods and emotional attitudes of those about him; later, conscious imitation finds its material in the actions and words of his companions. Chums, characters in books, on the stage, in history, in public life offer suggestions of tremendous importance. People do tend to grow like those with whom they constantly associate. The more immature the character, the more this is true. Hence the vital importance of having little children surrounded by people whose moral and religious lives are worthy to be copied, for copied they surely will be, both consciously and unconsciously. Hence the need of having the friends of childhood and adolescence, and the characters, whatever their source, that are held up to admiration those whose habits and ideals are good. So important is this matter of the power of suggestions furnished by characters in the child's environment that some psychologists will go so far as to claim that a child's moral character is set before he enters the schoolroom.

Fourth, as regards *habit formation*. LAW OF EFFECT.—One of the strongest factors in fixing habits of all kinds is pleasurable results; to have punishment follow violation of a desirable habit or an exhibition of its opposite is not nearly so efficacious. Punishment is a negative procedure, and results in a cessation of the desired response as soon as the punitive measure is removed. Positive satisfaction connected with the sought-for response is the method far to be preferred.

This means that the environment must furnish satisfaction of some kind when the child is truthful, obedient, generous, self-controlled, helpful. Somehow or other, Sunday must be a day to which he looks forward with pleasure; and church-going, prayer, and other religious observances must have an interest attached. The social habits formed in the early years must be put on the same level as all other habits and treated in the same way. Responses that bring satisfaction are the ones which are stamped in, whether moral or immoral. The child having no power of discrimination, no distinct moral sense, welcomes with equal readiness responses leading to criminal habits and responses resulting in upright living. The element he instinctively responds to is satisfaction. If that is present, then the response will, to his mind, be worth while. Of course what brings satisfaction must vary with the age of the child and his previous experience.[1] The motives appealed to will vary from obtaining the physical pleasure of eating candy to satisfaction from the belief in divine approval. The essential part to be borne in mind is that the desired result is a real satisfaction to the particular child. Because the motive appealed to influences children in general, or because the response required is right, means nothing in getting a particular child to form a particular habit so that it will be permanent.

Law of exercise.—Another part of the law of habit formation most conspicuously neglected by the organizations that exist for imparting religious and moral instruction to children, is that of frequency. Really to know the formulæ of mathematics, or the facts in history and literature, requires plenty of drilling, the expenditure of many hours a week for many weeks in the year with continual review and use in new ways as the years succeed each other. All this is well understood and provided for in the day school. But apparently in a total of fifty-two, perhaps of only thirty, hours in a whole year,

[1] Note Chapter V.

each such hour given over to many and varied performances, much of it wasted by poor administration, our Protestant churches expect children to get hold of facts historical, literary, and doctrinal, formulæ of public worship, to say nothing of inspiration towards right living. And, upon examination of the elaborate courses published by some of our leading houses or denominations, it is evident that next to no provision is made for any drill, repetition, or new use of material once presented. A cycle of four to six years may go by before a child ever hears a given story a second time. This is an economic waste of machinery as well as a pedagogic error.

Full neurone circuit to be used. — Fifth, in the field of morals and religion the danger that theory becomes divorced from practice is a very real one. As has already been shown, both morality and religion must be defined in terms of conduct. Ethics is not morality, nor is theology religion. A man may know the rules of conduct perfectly and yet be immoral. He may recite a creed or pass examinations in theology, and yet be irreligious. Too much of our time and energy has been used in developing the knowing side in religion and morals, while the conduct and the emotions have received but secondary attention. It should be clearly understood that in no sense is it being suggested that conduct should be blind; in fact, the reverse point of view was urged through the beginning of this chapter. On the other hand, knowledge which does not function in conduct is futile so far as religion and morals are concerned. Because instruction in morals and in religion is so often given as mere classroom exercises, as a matter of books and memory, it often happens that such instruction does not influence conduct. Vital instruction in these fields can only be given in connection with some living situation that calls for a response. Knowledge of facts is surely necessary in order that judgment may be exercised, but here as elsewhere, such knowledge means most when it is the natural answer to a question aroused by life situations. In this field we may

need to seek out, or to create opportunities for social experiences so as to provide a stimulating environment for the developing child and insure the realization of the familiar maxim " no impression without expression."

Sixth, *individual differences* count quite as much here as in other fields. Children will not respond to instruction and training in religion and morals in just the same way any more than they will to instruction in history or science, in fact greater differences are likely to show in the former field than in the latter. Moral and religious conduct are both so tremendously complex, involving as they do intellect, emotion, and action, that the chance for variation in response is very great. Some children respond chiefly in terms of thought; these are they who ask the questions so difficult to answer. Others trouble themselves little with questions, with the whys and wherefores, but simply live as best they can. Still others respond by feeling. To them the mystical element in religion, the self-sacrifice for the sake of the group, makes its appeal. Each type of response is worthy, but each needs different treatment. Again, the difference in the power of suggestion over children of different natures offers another problem. Discussions of big moral problems, sex questions, questions of individual responsibility may for one child be the very thing necessary to set him upon his feet and steady his judgment; for another child in the same class, such discussion offers all sorts of suggestions which may be directly harmful. Hence the need of much individual instruction in religion and morals, and the danger of relying exclusively on classroom instruction, even of allowing any classroom instruction at all along some lines.

Transfer of training. — Seventh, we have no right to expect in the realm of morals any direct transfer of a habit from one line to another dissimilar one with no focalization of an ideal, no learning how to stand the strain of attention. Because a child is courteous to one person it does not follow that he is polite to all others; that he tells the truth in some situations

does not mean that he is veracious in reality; that he is careless, disorderly, or forgetful in some matters does not involve negligence of others. It was a wise mother who warned her six-year-old boy on the eve of a visit to relatives to mind and obey his aunt just the same as though it were mother; but it was poor policy on the aunt's part to go off for the day omitting a similar precaution with regard to another adult left in charge. Here as elsewhere there must be training in holding the attention to difficult ideas, in formulating judgments in moral situations, in making many specific bonds between situation and response.

Training and instruction at different ages. — There is obviously plenty of growth involved from the condition of the infant to that of the moral and religious adult: and naturally, morality is not achieved in any other than a gradual way. Without a distinct feeling of self there can be little development, and this ego sense grows but slowly, dependent as it is on memory, imagination, and the companionship of other people of all ages. Ideals, too, are generalizations; and these take time to be formulated independently of the particular situations and the immediate groups of experiences from which they arise. Ability to discriminate, judge, and reason is refined little by little. Habits are formed by degrees, especially the higher hierarchies concerned with wide social adjustment.

How must training and instruction change as children grow older?

Stages not sharply defined. — A careful survey of the years of growth will reveal several fairly well-recognizable stages of development. Be it understood that these stages are by no means sharply defined. Children do not pass magically from the first to the second with their eleventh or twelfth birthday; nor do they pass completely, in all phases of their nature — habits, choices, ideals — from one stage to the next as one passes a milestone. Since these are stages of growth, here as elsewhere there is a gradual unfolding, ripening, becoming. With increased knowledge and larger scope of judging, more

opportunity is given for conduct to be rationalized, rather than merely habituated. With increased age and a less sheltered, controlled home life, children are forced to individual thinking, testing, deciding, choosing. With a widening environment, earlier standards may be recognized as temporary or inadequate, and a process, more or less explicit, of reconstruction may be set up. With frequent contact with all sorts of people inducing friction, emulation, dislike, admonition, affection, and the like, motives change both in kind and in amount of impulsive power. But these changes come about unevenly, so that children may be, at one and the same time of their physical life, in all three stages with regard to different phases of their social and religious life. However, there are predominant characteristics of each stage more or less typical of different ages of childhood.

Very early stage. — The first stage may be called the non-moral since at the beginning children are too young for rational choice, and their conformity to law is secured mainly by the law of effect modifying instincts into habits. In this stage such control is attained first by incidental pains and pleasures sequent to actions, second by the systematic administration of pains and pleasures by members of the society in which children find themselves. As imagination and memory develop the controlling factor is supplemented by the anticipation of blame or praise, and still later by some sort of ideal. The emotions of young children which training may utilize are largely fear, love, and wonder. Children are extremely credulous in this first stage, accepting undoubtingly much of what is told them. They have a strong sense of the mysterious, too. The wind is felt but not seen, the light is seen but not felt, voices are neither felt nor seen, only heard; so by analogy, it is not a far step to a postulating of a mysterious Being neither felt, heard, nor seen. As young children depend on adults for the needs of the body and for the need of love, so towards them the earliest trust, love, and reverence are directed.

Not only do adults relieve pain, they occasionally inflict it to bring about obedience; thus personality becomes the strongest factor in developing the sense of self, and a greater mystery than the forces of physical nature. Other persons, too, stimulate imitation and imaginative play. From the experience with these surroundings is born the " conscience," which inevitably reflects the customs, standards, and characters of those nearest. What is right, is what results in satisfaction to the children themselves and brings approval from other people. Little children need an atmosphere of love, trust, and social harmony, full and healthful provision for physical needs including rigid training in habits of regularity and cleanliness. They should find that it pays to do right, or to wait for the greater good, or to endure pains and disappointments bravely. Sense perception and love of nature should be cultivated and the formation of habits of obedience, truthfulness, courtesy, helpfulness begun. Stories of nature, myths, and wonder tales should intensify the emotions of awe and mystery, while God may be represented as something rather vague and distant rather than as an indulgent parent. Almost invariably children form an anthropomorphic concept of deity at this stage based on analogies of father and mother; beyond that, they may posit either a watchful presence judicially or beneficently inclined according to the teaching received, or a magic worker, or a confidante to whom they may chatter of the day's doings. It should be remembered that the main appeal in instruction should be to the emotional, imaginative, intuitive side rather than to the higher intellectual, presenting dogma which cannot be assimilated and may later have to be rejected. Children in this early stage may have simple habits of private and family worship inculcated, and begin before six to share in social worship with a large group also.

This first stage is often called non-religious. True, from three to six years old a child may ask more questions about

the causes of things and the nature of God than the most erudite theologian can answer; but this curiosity does not mark, necessarily, the beginning of either a scientist or a devotee. These questions, as also the early fears, personal attachments, and sociability, show us the line of least resistance for the development of a religious consciousness. How amazing to the modern psychologist is the regret of Cotton Mather and others like him that a child under seven did not show much sense of sin nor concern for her soul's salvation! Scarcely less arresting, however, is the spectacle of the pious ten-year-old who anxiously scans a line of conduct before embarking on it to see if it is right and acceptable to God, and who begs to be told of her faults that she may eradicate them. The normal mental activity of the first case, the healthy, animalistic unconcern of the second, the morbid introspection of the third are none of them religious or irreligious, though from each may come a contributing factor to the later religious consciousness.

Middle stage. — The age from six or seven to about ten forms part of what Kirkpatrick calls the period of competitive socialization, called also childhood by Chrisman, early childhood by Coe, boy- and girl-hood by Tigerstedt.

What is the formative period?

Characteristics. — During these years children are influenced by a greater diversity of factors in their moral education than in the preceding years. They begin to go to school and to live more independently of their own family; they meet and deal with many others near their own age. In their games and companionship with other children they form a rough ideal of give and take, of justice, fair play, and physical bravery. Being keen and zealous for their own rights and pleasures they soon come to guard against any actions of others that curtail these; but they find that their own deeds are in turn submitted to the same jealous scrutiny by their playmates. Thus cheating in a game, or greediness, early rank, from the child's

point of view, as wrongs, undeniably if they themselves are the sufferers thereby, vaguely so if their fellows resent such conduct in them. From the pure individualism of the earliest years they progress to membership in a clique or gang the units of which may indeed quarrel and nag among themselves, but are at least united against outsiders. Thus, empirically, they adopt into their moral code as wrong, cruel teasing, the lie, excuse, tale-bearing, or cowardice that betrays a friend. Meanwhile their standards of courtesy, truth-telling in the abstract, obedience, and those other virtues to which the adults about them may or may not be training them, are most likely quite undeveloped, chaotic, or formulated in talking-machine fashion.

At this age there is less unquestioning acceptance of what is taught, rather an awakening of incredulity due to an increasing desire for certainty. The interest shifts from wonder tales to true narrative, history, and hero tales. There is a capacity for more prolonged attention, for greater responsibility, and particularly for a great deal of rote memorizing. The perceptive powers are still in advance of the reasoning. The moral sense is derived from custom; shame arises not from the consciousness of having performed an unlawful deed, but from having been found out. Virtues are acquired by imitation, not by conviction. Approbation of one's social equals becomes gradually more important than that of those in authority, as many a teacher knows to her cost. There is a rising desire for independence. The idea of God is more that of a big Father than that of a big Man as in the preceding stage. Girls are more prone to superstitious beliefs than are boys, apparently.

Their TRAINING AND INSTRUCTION must allow for these characteristics. As the character may be formed largely by suggestion and imitation, the surrounding personalities must still provide the fitting material for the spontaneous expression of the child's highest self. Consistency, as well as correctness of example, is of the highest importance. Children soon see the discrepancy

What principles should guide the training in this period?

between the teaching and actions of other people, and as this is a gap which needs closing in their own lives, it is well to present the example of "applied ethics" before creeds.

There should be consistency too in the matter of rewards and punishments, so that the earlier desire to please others may be clearly directed to pass over into a conscious determination to do what is known as the right. The habit of implicit obedience is still the foundation for later faith and the other virtues, though it begins now to be transformed into rational obedience. Self-control must be developed in newer and newer fields. They must learn that though there are many matters in which their preferences may be consulted, there are also very many occasions when "I don't like to," or "I don't want to" makes not a particle of difference to the necessity for action. Not to learn this lesson early is a tremendous handicap in the later, adolescent period. Adults should help children to distinguish clearly between times when they may choose what is to be done, and times when it is not a question of choice, only of loyal and prompt carrying out of orders. There must be an inexorable holding to account for deeds good or bad that children may feel the force of social law and individual responsibility. Impulses to mischief or teasing which result in unhappiness to others or harm must be inhibited in favor of impulses leading to generous, kindly, courteous behavior. Habits that are the foundations of later sexual purity must be formed and their opposites carefully guarded against.

What teaching can be given in this stage?

On the instruction side, the more realistic imagination, love of formalism and ritual, ready rote memorizing, curiosity instigating eyes and hands to explore are signals all too frequently ignored in the direction of moral and religious teaching of children from eight years old on. During this period they should be approached mainly through action and feeling rather than through ideas and abstractions. It is easy to talk to children in symbolic

or abstract terms, but their daily experience is far behind in its degree of abstraction; we should remember that symbols are appreciated only after the things for which they stand have been felt as realities. Meanwhile, children understand conduct in terms of personality; morality for them is concrete and immediate, to be lived rather than discussed. We should work with them on the active and practical rather than on the passively intellectual and theoretical side. Action and feeling can be right before concepts are formulated; in fact, all concepts need this very broad basis of particular instances, even though they are moral and religious ideas. The natural childish curiosity in sex matters should be satisfied simply and with absolute veracity rather than met with refusal to answer or equivocation. Repression will lead only to their seeking, and usually getting, misinformation from impure sources, working harm that is difficult to undo; evasion or falsehood will engender a distrust of the adult when later enlightenment comes, and raise a barrier of silence perhaps never to be torn down in adolescent years when boys and girls need a wise confidante. Sex information should be given incidentally, but simply and as a matter of course, changing the probable atmosphere of mystery into reverence, perhaps scientific interest and poetic appreciation. In imparting religious facts, catechisms and homilies should be replaced by a giving of information through dramatic stories of the duties and virtues expected at this age; any code given must be true for all time, especially in its disciplinary values. It is cruel to teach religious doctrines that cannot be understood, and that may have to be unlearned or rejected later. Advantage should be taken of the power of memorization to present the best of the sacred literature such as can be approximately grasped, and the poetic beauty of which can be partly appreciated. To fail to do this in the years before twelve is to deprive children of what they would otherwise come to look back upon as one of the most valuable means of arousing and sustaining their interest

in spiritual things. There is scarcely any limit that need be set to the degree of familiarity with the biography, history, and poetry of sacred writings. In them children have a birthright such as they have not in the stories of the Odyssey or Iliad. Emotionally and inspirationally the effect of this early, everyday acquaintance with the literature and history of their religion is as noticeable as any other single thing in their environmental influence. Habits of religious observance in the home, in public, and for personal use should be formed for immediate needs, though also as a safeguard in future upheavals. Regularity, simplicity, and dignity should be their main characteristics.

This early, non-moral, non-religious stage passes imperceptibly into the *transition period*, beginning perhaps with pubescence, perhaps with early adolescence. This period is marked chiefly by the greater personalization of moral teachings, by an awakening self-consciousness in matters religious. Though between ten and twelve children rarely tolerate much direct, individual application of moral truth, by fifteen a girl is frequently anxious for such; and before the teens are past the great majority of personalizations have taken place for both sexes. Girls develop rather sooner than boys and tend to be more introspective and individualistic; even before twelve their ethical sense will make possible a truly moral habit while boys seem still in the " barbarian age." For boys especially it is the time of the formation of the gang, for love of adventure, feats of skill bringing out courage and recklessness, later of love of teamwork.

What are the characteristics of the pre-pubertal years?

Training should provide many and varied outlets for physical activity, should throw larger responsibility on habits of decision and choice, should recognize and direct the gang spirit in boys, providing and guiding social companionship rather than seeking to eliminate or suppress it. The dramatic and imaginative instincts may be appealed to in religious

ceremonies, the love of competition and rivalry by emphasis on progress. Instruction may still center around historical and literary characters, suggesting rather than formulating ideals. The interest in language so often shown in the use of a secret tongue, in enjoyment of puns, conundrums, epigrams, and the like has not been so widely utilized as it might have been. It may be the foundation of acquaintance with, and appreciation of, the wisdom literature; but the teacher should ascertain that it meets a felt need in individual cases, and is not merely a matter of rote memory.

Of the *adolescent period* we have many studies. Its main characteristics are well known since the exhaustive work of Stanley Hall. Others who have contributed to our knowledge of the development of the religious side of our nature at this time are Lancaster, Leuba, James, Daniels, Slaughter, Slattery, Coe, and Starbuck. A review of the more important bases for moral and religious education is all that is necessary now.

What changes are prominent in early adolescence?

CHARACTERISTICS. — Rapid physiological changes take place, and these, together with the probable changes in home life and the sharing of wider community activities, make the period peculiarly difficult to live through with poise. Though there is already a large system of organized personal habits, yet strong, intense new impulses from within, fresh customs and standards without, the new feeling of individuality and the immaturity of the will combine to provide ordeals that test the adolescent in all sorts of ways. New possibilities open up in the way of emotions, interests, feelings of self, capacities for reasoning, reorganization of the personal life in its relationship to the Divine and to the larger social wholes. There is a heightened sensitiveness to the phenomena of Nature, greater appreciation of the beautiful, the good, and the true, with the beginning of abstract questionings. The whole being is likely to be in a ferment from twelve to sixteen, though temperamental differences are an important factor in deter-

mining the length and intensity of the emotional activities of the period. The social nature is being born, as it were, at a psychic crisis, so that at no time is there apt to be greater disparity between insight and power to act, between judgment and moral control; at no time is the moral equilibrium more easily upset.

What is known as the "storm and stress" period is characteristic of many. It may last from months to years and present one or more acute phases. Essentially it is that realization of duality needing unification referred to earlier. Other individuals experience a very gradual, quiet religious awakening, an orderly maturing of the ethical, intellectual, and æsthetic nature while the progress in morals comes about imperceptibly, keeping pace with the felt deeper meanings of the intellectual life till intelligence controls and directs the feelings. A third type are conscious of some definite surrender of personality to the Divine. This phenomenon, known as conversion, lasts in its various stages about one fifth the time that the storm and stress period lasts, so that, psychologically, it is much like a foreshortening or epitome of that experience. Conversions, awakenings spontaneous or special, storm and stress acute stage, or period of carelessness, come at about the same age, fifteen to seventeen for boys, fourteen or so for girls. The ages twelve to thirteen and nineteen to twenty are also critical from the point of view of an upheaval in conduct, emotions, or intellect.

TREATMENT. — From all this consideration of the adolescent period there come some clear suggestions for the religious and moral education. In a general way it may be said that the needs should be met fully at every point. The process of gradual, even, symmetrical growth should be aimed at rather than violent experiences of any kind. It is better not to bring great pressure to bear from the environment towards definite religious experiences. With some natures these things are possible, with some they

How can the "teen" age boys and girls be helped?

are not, whereas development is possible for all; and it is the part of wisdom to provide all things necessary for a normal growth rather than to attempt any surgical reconstruction of an individual. Much emotional excitement will only aggravate the less desirable features.

A sane, healthy home atmosphere will be of the greatest possible help to the adolescent, with wise, sympathetic toleration of any extremes and vagaries. The secretiveness so common to both sexes makes it difficult to be certain, in individual cases, of the best channel through which to offer help. However, the attitude of " common sense " on the part of the adult, of taking the boy's or girl's experiences as only natural, to be expected, as a matter of course — when they occur, not inducing them — will do much to encourage openness with some natures and help counteract the agony of doubt or the morbid introspection. Some others are best helped by a treatment of their case as especially interesting though not dangerous, and not to be classed and massed with other typical cases. Either way, difficulties should be treated seriously, rather than minimized, and confidence inspired by wise counsel. Over 70 per cent of girls have been alienated from their mothers at this period by a harsh, deprecatory, or tactless treatment.

Authority should gradually relax and greater responsibility be thrown upon the individual. " Obey me " should become " Obey yourself." Boys and girls must learn to meet crises for themselves, to readjust their actions to the demands of the larger social unit of which they are coming to realize themselves members. They must face and decide questions for themselves, and relate the value of their individual acts and immediate activities to the broader system of morality which they can now appreciate. Problems should seldom be solved for them, but many interests should be provided, especially those leading to wholesome activities. A healthy body, plenty of mental occupation, and abundant outlet for physical, æsthetic, social, and ethical needs will help form habits of

untold value. Physical disturbances may be the sole cause of a morbid conscience which has, indeed, been described as a case of "nerves." Action rather than theory should be emphasized.

Foolish questioning may be replaced by wiser study, by careful direction of the reading, and by making opportunity for larger social service. At no time is the doctrine of "learning by doing" more important, nor the need of living up to the faith of which one is possessed. Introspection and spiritual vivisection should yield to the impetus from within outward. "Something to love, something to know and something to do" is necessary for the unfolding nature. Personal friendships should be watched over, though discreetly at a distance, and guided and controlled as far as may be courteous and possible. Hero-worship in literature, history, or in current life may be partially directed at least by presenting and dwelling on characters worthy of such devotion. Abstract ideas may also be presented and ideals formulated; though, paradoxically, personality has a new meaning and influence. Broader studies should be gradually introduced in history, literature, and ethics. Sacred literature and religious history will give greater content to the individual experience. The Bible should be taught as literature still rather than as dogma, but in later adolescence doctrinal studies and the study of church history or of comparative religions will prove fruitful. Instruction in dogma and doctrine will be in place earlier with girls than with boys, and with some natures than with others. When doubts come, adolescents should be taught to be very patient and tolerant with them, and on no account to let them interfere with their morality. They must regard doubt not as extinction of belief, but as reconstruction with exclusions, a phenomenon of change of concepts. Historical and critical study of the Bible will be a help here, followed by philosophy and ethics.

For boys especially, the organizing craze must be met successfully, and social companionship provided with some

physical activity as its immediate end. For both girls and boys, sex instruction is absolutely imperative; purity and consistency of life should be linked forever with their religious experience. Religion should pick up all tendencies which are organizing in a new way and give to them its own specific, deeper meaning.

Only after the period of transition may we speak of the individual as truly moral, when with maturity he brings his conduct into line with his reasoned choices. Though this merges into the adolescent period, and though in different aspects of personality there is a continual fluctuation from one period to the other, it lies mainly beyond the ages treated here, and so falls outside the scope of this study.

Exercises

1. Of what ages, roughly, are these statements [1] true?

A. "There is a keen intellectual appetite for facts. The child wants to know of every story 'Is it true?' . . . At this age the choicest literature can be memorized even though the meaning be only partially understood, . . . there is reasoning but not abstract, . . . concrete examples alone appeal. . . . Habits of conduct are rapidly formed, the proper motive for which may not be deeply felt. . . . The capacity for unselfishness is . . . as yet only budding."

B. "This age is characterized by a feeling of personal honor, by a keen sense of justice manifesting itself rather more in insistence upon one's own rights than in regard for duties to others, by a strong love for the heroic and desire to emulate it, by a longing for larger activities . . . especially by the growth of a sense of relationship to other persons. . . . Through other lives . . . the child may . . . be led to find God in his or her own life."

C. "Surplus energy is the most prominent feature . . . there is only a small amount of knowledge . . . undeveloped thought power and little power of attention. . . . This is the age in which the child is gathering knowledge not by study or thought but through the senses. . . . Its training in ethical and religious

[1] Taken from the Bible Study Union Series of teachers' manuals.

knowledge must be quite largely by concrete illustrations. . . . His desires are largely selfish, the teacher should therefore . . . appeal primarily to the feelings . . . so that the child is led to want to do right.

2. For what ages are the following materials or methods suitable for religious instruction:

Lives of heroes; the history of religion; myths and wondertales; memorizing Psalms 19, 1; history in story form; fables and parables; memorizing liturgical prayers; history from the Exodus to 4 A.D.; memorizing 1 Cor. 13, the Beatitudes; memorizing hymns; doctrinal teaching of the New Testament; memorizing proverbs; inspirational biographies; literary study of single books; sand-table maps; crayon and picture pasting; dramatic representation; diagrams, charts, and statistical work; stereoscopic views; map-drawing.

3. Of what moral value is the "gang" tendency in the years 10 to 15?

4. What accounts for the constant disputes and bickerings of children from 9 to 13? Would you check it? Why, or why not?

5. What is probably lacking in the moral education of children brought up in an institution run on the congregate plan?

Questions for Discussion

1. What would you do with a child who is too easily influenced?
2. How would you deal with obstinacy in a little child?
3. What can you do for the very selfish fifteen-year-old?
4. How would you help cure exaggeration in a ten-year-old?
5. Give some suggestions for dealing with cruelty in a six-year-old; impudence in a twelve-year-old girl; obscenity in the years eight to twelve; bullying on the playground.

References for Reading

Third Year-book of the National Herbart Society, 1897.
G. A. Coe, *Education in Religion and Morals.*
W. B. Forbush, *The Boy Problem.*
G. Hodge, *The Training of Children in Religion.*
I. S. Wile, *Sex Education.*
J. A. Puffer, *The Boy and His Gang.*
M. Slattery, *The Girl in Her Teens.*

CHAPTER XIV

PHYSICAL DEVELOPMENT OF THE CHILD

GOOD HEALTH AS A SCHOOL RESPONSIBILITY. — It is a generally accepted educational principle that the school as well as the family has a definite duty with regard to the physical development of children. In discussion most teachers would admit this principle, but in actual practice not half enough is being done for the health of children, despite the tremendous changes of the last ten years. Even compared with what has actually been accomplished in some of the European countries, we are lagging woefully in the rear. There are several causes for this state of affairs. First, except in the case of infectious diseases, the parents have the final word with regard to the physical side of child nature. The school can act in things intellectual and things moral (to some extent), but it is the prerogative of the home to decide in most things physical. For instance, the school authorities may say that the child must stay in this or that class, although even this power is limited in some directions; they may suspend the child from school attendance for bad behavior, or perhaps send him to the truant school or the class for incorrigibles; but when it comes to a child's need for glasses, or to have adenoids removed, or for different food, or for more exercise, — the school can do nothing but recommend, — the parents decide. Second, although convinced in theory that it is part of their duty to conserve the health of the child, most teachers in practice allow the matter to be pushed into the background, or to be forgotten entirely by the pressure

Why is good health one of the aims for the school?

of the demands of lessons. The field is comparatively so new that its importance has yet to become vital, not only to teachers but also to parents. Third, the lack of free clinics for treatment of all kinds handicaps the work seriously in all but the large cities. It is generally acknowledged that, in rural districts, the physical health of children is worse along some lines than in urban districts, despite the crowded conditions of the latter. These three difficulties will have to be met before the physical side of child nature will receive its fair share of attention.

Interdependence of mind and body. — The reasons for the responsibility of the school in this matter are, first, if the school is to train the minds of boys and girls, it must look after their bodies too, for the well-being of the one is dependent on the health of the other. We are slowly reinstating the aim of the ancient Greeks, "a sound mind in a sound body." Just how far the two are interdependent is a question not yet answered. How great a handicap is poor health, or the presence of various defects, or of unbalanced nervous condition, we do not know. That it is a handicap, that some defects are a very serious handicap, there can be no doubt. Consider the following facts. (1) Porter[1] found in his examination of 34,500 St. Louis school children that pupils of any age who were above their normal grade were heavier and taller than those of the same age who were below their normal grade. For instance, the average weight of 11-year-old boys in the sixth grade was 73.34 lb.; in the fifth grade 71.29 lb.; in the fourth grade 69.24 lb.; in the third grade 68.12 lb.; in the second grade 65.45 lb.; and in the first grade only 63.5 lb. (2) Adult mental defectives are on the average more defective all round physically than normal men and women. (3) Warner[2] and Ayres[3] both found a

[1] Trans. Acad. Science, St. Louis, 6; 1894.
[2] Warner, The Study of Children, ch. 13.
[3] Ayres, Laggards in Our Schools, p. 125.

larger percentage of physical defects, of poorly nourished and nervous children among the dull than among average children. (4) The removal of certain physical defects and the improvement of health conditions have been followed in numerous cases by definite, and in some cases by remarkable, changes in mental capacity and moral balance. No attempt is being made to say which is cause and which effect in the first three lines of evidence quoted. The same general cause, — namely, heredity, — may underlie both the physical and the mental defect, but this argument will not apply to the last set of facts referred to. It seems fair at present to conclude that physical superiority usually accompanies mental capacity. Therefore if the school would do its duty by the child intellectually it must not only prevent the spread of infectious diseases, but also must take measures in the line of both preventive hygiene and positive treatment.

Happiness depends on it. — Second: — one of the definite aims of education to-day is health, not merely because health gives greater possibilities for intellectual development but because it makes for happiness. Emotions, temperament, morals, are all bound up very closely with health. Every child has a right to happiness, therefore give him health. Also every child has the right to be well-born. Much of the disease, deformity, and weakness in the world is a matter of inherited tendencies. In order that the next generation may be physically better than the present one, the children of to-day must be guarded, guided, and treated along all possible health lines.

Economic conditions make it imperative. — Third: — the public schools are provided at state expense in order that the children of the state may be self-supporting citizens, contributing in their adulthood to its development and prosperity. A school that because of a one-sided point of view, or because of an unfair division of time, or because of lack of appreciation of its responsibilities, fails to achieve this end, pitiably

fails in its function. Of the thousands of incompetents who fall back on the state for support each year, the thousands always a drag and a menace, those found in the insane asylums, the jails, on the streets, how many of these are physically unfit, and have been so since childhood? Might not the teachers of these children have done more for them and for the community by discovering the physical trouble and maybe setting that right, than by any teaching which merely drills and informs the mind?

The organization and demands of the school make it responsible. — Fourth: — a teacher must take cognizance of the physical side of child nature because in the school she is requiring certain tasks, forming certain habits, allowing certain opportunities, imposing certain deprivations, each of which procedures has its own dangers so far as the physical well-being of the child is concerned. The teacher must take measures to minimize the dangers, and if definite harm should result see to it that needed remedies are applied. Schools require that children learn to read: have they any right to ignore the resulting eyestrain no matter what the cause? Examinations are necessary in most schools, but teachers should know the attendant ills. Children must learn to write, but habits of posture which result in curvature of the spine are not necessary as a concomitant. Is it wise to require much home study of certain classes or children if it is done under conditions which are definitely injurious to health? The very tasks which it imposes, because they react upon or involve the physical child, force responsibility upon the school and its teachers for the health and growth of the children. Regard for health is not a matter of choice or of philanthropy, it is a logical outgrowth of the school's own requirements in other lines. All those who deal with children, teachers especially, must realize the importance of this problem of the physical development. So long as they are not alive to its significance, so long as they do not know the

facts of child development, so long as they are ignorant of the danger points of the causes of increased susceptibility, — just so long will the children, both of this generation and the next, suffer.

PHYSICAL DIFFERENCES BETWEEN CHILDREN AND ADULTS. — As children differ from adults in all the intellectual and feeling processes, even so they differ in things physical. It is just as true that "the child is not the man writ small" in health and physical development as in intellectual fields. Just as general adult psychology will not answer the problems concerning the mental and moral processes of children, so the hygiene of the adult will not meet the needs of the child. Just as we need a child psychology, just so do we need a child hygiene. The differences between the child and the adult on the physical side are tremendous. Some one has said that the child is about as much like the adult as the caterpillar is like the butterfly. How great that difference really is the student can fully realize best through intensive study of individual children. Terman says, "The child is different from the adult in every fiber, every blood corpuscle, every bone cell, and in the relative proportions of all his parts. His resistance to disease, his powers of recuperation, his food and sleep requirements are all unlike those of the adult. He is differently affected by every element of environment and regimen."[1] "The relative size and the balance of organs is not at all the same in the young child as in the adult. Roughly and approximately, between birth and maturity the muscles increase in weight about thirty-sevenfold; the lungs about eighteenfold; liver, heart and kidneys about twelve or thirteenfold. The young child requires far more food and oxygen, and produces far more carbon dioxide, energy and waste for each pound of weight than the adult. . . . If adults and children of different ages

What are some of the differences between children and adults physically?

[1] Terman, The Hygiene of the School Child, pp. 47–48.

have different rates of mortality and morbidity, a different balance of organs, different relative incomes and modes of expenditure, in one word, a quite different metabolism and habits, it is surely not too much to say that they have different constitutions and are leading different lives. They must be treated and trained quite differently. Inferences drawn from the life, habits and needs of one age may not apply at all at another. What is beneficial to the adult may harm the child; and the reverse is equally true."[1] Not only is the child totally unlike the adult physically, but a child of one age will differ to a great degree from one of another age. What may be healthful exercise at one time may be a serious strain at another. Work that is pleasurable to a little child may be the greatest bore to an older one. Diet that is eminently suitable for a four-year-old is quite insufficient for a ten-year-old.

FACTS OF PHYSICAL DEVELOPMENT. — What, then, are the important facts concerning the physical development of children? First, as to the factors operative in producing physical nature.

Factors determining; heredity and environment. — There is great difficulty in assigning to each its share of responsibility because of the complexity of the problem. The internal factors, such as sex, family, and racial heredity, and the external factors, such as food, freedom from disease, exercise, sleep, ventilation, relaxation, climate, season of the year, etc., are all operative all the time and are inextricably mingled, The general opinion of both medical men and anthropologists seems at present to be that heredity is the more influential factor in determining stature, time of puberty, general development in height, weight, and other dimensions, and resistance to disease.

On the other hand this does not at all mean that environment has no effect. If certain elements in the environment

[1] Tyler, Growth and Education, pp. 106 and 107.

make the exposure of children to contagion much more common than under other conditions, there can be no doubt that environment is detrimental to normal physical development. However, we have but little scientific work upon which to base conclusions concerning the effect on an individual of insufficient food, light, air, exercise, play, etc. Probably the most dangerous of the environmental elements is improper feeding. Most of the work which has been done along even this line has not eliminated the factor of family heredity from the problem, nor have the many concomitant environmental influences been given recognition. For instance, children of the wealthy and the poor have been compared; factory children and others; those of the "more favored class and the artisan class; children of the professional class and the slums;" city and country children. Obviously this does not isolate the factor of nutrition. Either in the city or the country a child may be crowded with many others during sleeping hours in an ill-ventilated room, may be poorly housed, overworked or semi-idle, with a personal history of many or few diseases. The wealthy mother may feed and exercise her child just as improperly as the poor mother. At present, therefore, we have not reached the point of analysis of environmental factors so as to be able to make absolutely definite statements regarding any one of them; and as man is at least partly responsible for his environment, both heredity and environment are working in the same direction, and which is the controlling cause we have no means of telling. Investigations which note the effect on the same classes of children of different kinds of diet, school lunches, recess luncheons, etc., should throw more light on this problem. Two factors in connection with feeding seem fairly certain: first, that underfeeding, to have any permanent stunting effect, must be of long duration; second, that the feeding of the infant up to a year or a year and a half old is of the utmost importance.

Growth in height and weight.—As has been indicated, racial and family heredity determine for the individual his ultimate height and weight, while the sex largely determines the rate of growth; so that statistics derived from a study of French boys would not be applicable, say, to Japanese girls. The figures here quoted are drawn from studies of American and English children. Taking the average length of a child at birth as 19 inches, and average adult height as 67 inches (M.) and 63 inches (F.) respectively, it will be seen that a total gain of 48 or 44 inches is made. Of this, the most rapid gain is in the first months of life, since at fourteen months old roughly one quarter the total increase, *i.e.* 12 inches (M.), 11 inches (F.) will have been made. A male has gained his second 12 inches of growth, making him 43 inches tall, by the time he is slightly under six years old, taking therefore 56 months to gain as many inches as he did at first in 14 months. His third quartile, making him 55 inches tall, is added by about twelve and a half years of age, thus taking perhaps 74 months. He may reach his ultimate height anywhere from eighteen to twenty-three years of age. Very similar facts may be stated for the female, except that her third quartile's gain has been made by ten and a half. In weight, the total gain to the age twenty-two is approximately 138 and 117 lbs. respectively, of which the first quartile is gained before five years old for either sex, the second by eleven and a half (M.) and ten and a half (F.), the third by fifteen and a half (M.) and thirteen and a quarter (F.). Other rough statements that may be made are that a child is half his ultimate height at two and a half years old or slightly less. Between the ages of five and ten a child grows about two inches a year, adding 2 to $2\frac{1}{2}$ lbs. for every inch gained.

The *rate* of increase then, in both height and weight, gradually diminishes from birth, though by no means evenly. There is a slight retardation in growth at about six years

old, an acceleration at eight (M.) or seven (F.), reaching a minimum rate at eleven (M.) and nine (F.). Following this period of slow growth is one of rapid growth reaching its maximum at fifteen (M.) and twelve and a half to thirteen (F.). The increase in height up to the time of maximum growth is principally due to growth in length of legs; after that time the trunk grows rapidly. Rapid increase in height is followed by gain in weight. Development, *i.e.* qualitative rather than quantitative change in the cells, should always follow growth. Times of rapid growth are times of increase in vigor and energy, hence these periods are of great educational value. Though periods likewise of high fatigability they are dangerous only in the way that a rapidly moving machine is in more danger than a slow moving one.

We know too that, contrary to popular opinion, in cases of delayed puberty, the individual is not so tall eventually as those who begin to mature earlier; though the adolescent acceleration is more marked, it is briefer in duration. Other than the sex glands influence growth, particularly the thyroid. Any defect or disease in the thyroid, or its absence, is accompanied by a lack of growth and by a special kind of mental defect, both of which can, however, be remedied if treatment is begun sufficiently early by supplying the constituents in the diet that the gland should normally have secreted.

Climate and season affect growth also, climate in that taller races are found in the temperate zones, and season in that boys have been found to increase in height more in the spring and summer than in the fall, and to put on weight relatively more from August to December. We need further investigations dealing with races emigrating from one zone to another, also on the annual variation, and on weekly and monthly fluctuations said to exist. Statistics from South Africa and Australia, as well as of different nationalities, would be valuable.

Growth and development of various parts. — The growth of the body does not proceed as a whole, but by parts and successively. The various organs seem to follow a rate and rhythm of their own, and to develop quite independently of other organs. Thus the time of maximum growth of one part may be the time of minimum growth of another. For example, the brain increases in size two or threefold during the first year, but only 10 per cent more during the second year. There is a continued slow growth till puberty though by the sixth year it has almost reached adult size. By the twelfth or fourteenth year its growth has practically ceased, except for very slight increase even into the third decade. The muscles and intestines are largest in the fifth, the heart and lungs in the eighth decade. At birth the size of a cross section of the heart compared to a cross section of the large arteries is as 25 to 20; at puberty it is as 140 to 50; for the adult it is as 290 to 61. At fifteen years old a boy's limbs are relatively longer than they are either at eleven years old or in adult life. Detailed facts are too numerous to be given here; but that does not lessen the danger of lack of acquaintance with them on the part of parent or teacher. For instance, they should know of the risk of too vigorous exercise of an eight- or nine-year-old child while his heart is still small in proportion to his arteries; and that a child of six needs twice as much oxygen for his weight as does the adult. They should realize that the greater plasticity of the child's bones makes deformity from bad posture a very real danger. They should remember that boys are at every age superior to girls in lung capacity and in strength of hands. They should know that children of three require 40 per cent as much food as adults although they are only about one fifth as large. The danger is of underfeeding or improper feeding, not of overfeeding. The answers to many school problems and the principles of much of school discipline must be found through a careful study of the physical growth and development of the child.

Physiological and chronological age. — The differences in the rate of growth in every organ of the body, the skeleton, and nervous system are important; but even more important for the individual child is the fact that there are large variations from any "average" rate of development within any one year. The number of years a child has lived is no sure sign of his physical development. In a group of boys fourteen years old some may be still in the prepubescent period, some may be at that time in the stage of transition, and some may be post-pubescent. Crampton[1] in his work with the boys of New York City found that by the time they reached high school age, about thirteen and one half, the number of pubescents, pre- and post-pubescents was almost equal. Although these individual differences in lack of correspondence between chronological age and maturity are greatest at the pubescent period, they still occur, and are important, earlier. It may be that girls are a year ahead of boys in physiological age by the time they reach school age, so that, for instance, a girl of five may be ready for school but her brother to be equally ready would have to wait until he was six. The question of the educational significance of this fact of lack of correspondence is by no means answered. In fact two difficulties must first be met, *i.e.* the relation between maturity and mental capacity must be definitely determined, and an agreement as to the best measure of maturity must be decided upon. The evidence we have on the correlation between maturity and mental capacity is in favor of a positive correlation, but the results are not final.

What is meant by "physiological age"?

Even if no such positive correlation is ever proved, the emphasis on the distinction between chronological age and physiological age is an important one. The fact is that children who have lived the same number of years are not the

[1] Crampton, Influence of Physiological Age upon Scholarship. Psych. Clin. I.

same physically. They cannot be the same mentally, though the difference here may be less. We cannot treat all nine-year-olds alike — putting them all in the same school grade, expecting them all to be the same height, demanding the same quantity and quality of mental work, assigning tasks requiring the same fine muscle coördination — just because all have passed their ninth birthday. Also it is true that physical maturity brings with it certain ideas, ideals, attitudes despite the lack of school training. Simply because a child has lived 14 years is not enough to insure either the physical strength and maturity or the intellectual development that factory, mill, or any other form of work demands. The 12-year-old, non-English-speaking child cannot well be taught with ordinary second-grade children. The 18-year-old moron with 10-year-old mentality is by no means ten years old in other ways. The question of co-education, junior high school, methods of instruction, especially in religion and morals, must take account of these facts. The religious school that classes all 14- to 15-year-olds, boys and girls alike, together to take its graded course marked for that age is probably making a mistake far-reaching in its effects, and much worse than a similar classification of all 7-year-olds would be. The treatment of the juvenile criminal, both before and after conviction of crime, would be materially altered if these distinctions were kept in mind.

All the way through this discussion the lack of knowledge and of scientific facts of child hygiene and physiology has been evident. Some characteristics of various ages are recognized; for instance, that the sensory development of a child precedes the motor, and that the intellectual development follows both; that the lung development of the pre-adolescent girl is far inferior to that of the boy; that the development of the organs of reproduction with their correlated changes is the most significant fact of pubescence. But very much of such knowledge is only the result of observation, and is

not scientific. For example, because of the changes taking place at adolescence the health of the girl has been shielded and guarded. But that is too late; the sex instinct, with its accompanying bodily changes, does not develop rapidly in a few months; it has the same characteristics as all other original tendencies, — namely, a slow, gradual ripening. Moll claims that the beginnings of such development may be found among six-year-old children, and certainly a very large percentage of girls have matured by the time they are twelve and one-half years old. The time to guard the health of the girl, the time to build up vitality and resistance power is from nine years old on. To begin at twelve is to begin when the opportunity is passed. This then is a problem for grammar school quite as much as for high school teachers. The same argument applies to boys, only they are a year or two behind the girls in age of development.

What both teachers and parents need are first reliable standards for measuring development stages in child growth, and then measures of the correlation between these stages and various types of capacities.

SOME CONSTRUCTIVE MEASURES FOR THE IMPROVEMENT OF HEALTH CONDITIONS. — Although teachers and parents are rather working in the dark so far as some phases of the physical life of the child are concerned, still work of considerable importance has been done towards the prevention of certain defects and diseases among children and the remedying of certain others.

Inspection, hygiene, special studies. — The establishment of the school nurse and of the medical inspection of school children has done much to prevent the spread of contagious diseases and to promote the early detection of some of the grosser defects. The hygiene of special subjects, such as reading and writing, and the equipment of the schools with books, blackboards, seats, etc., in accordance with the physical demands of the child, have done much to prevent eyestrain

with its train of evils, curvature of the spine, etc. The studies in fatigue with their resulting influence on length of class periods, length, distribution, and character of recess periods have worked for the nervous betterment of children. School lunches, out-of-door classes, free clinics of all kinds have both improved the health of the school children and alleviated some of the suffering due to defects. But the health of the children will not be properly conserved until each individual teacher recognizes her responsibility in this direction. In some districts, such measures as have been indicated are not possible; then the teacher alone is responsible. In all cases the initial step must often be taken by the teacher. This problem is not one which can be adequately solved by providing specialists. They are necessary in the long run, but the greater responsibility for close observation and detection of trouble, for suggestions of remedies, and for persistent endeavor to have means taken to relieve must be on the teacher in the schools.

Recognition of defects. — The common defects of sight and hearing have already been discussed in Chapter VII. Other defects which influence a child either physically or mentally or both are: defective teeth, adenoids and enlarged tonsils, defects of speech and nervousness.

What are some common school defects?

Teeth. — Care of the teeth has been urged in times past for two reasons: first, because bad teeth are ugly and good teeth are an element of beauty, and second, because such care prevents suffering caused by toothache. These two reasons are still in force, but to-day much evidence is being produced to show that the care of teeth is necessary not only for bodily health, but for mental health as well. "Defective teeth may affect the health of the entire body. The influence is chiefly of four kinds: (1) decreased power of mastication, due either to decay or irregularities of the teeth; (2) the toxic effect

What are some results of having bad teeth?

of pus which is absorbed directly into the blood or taken into the stomach and intestines; (3) reflex nervous disturbance due to pain, impaction of teeth, etc.; and (4) the possibility of acting as a breeding-ground and distributing-point for bacteria which cause infectious diseases."[1] Indigestion, anemia, and even rheumatism have been traced directly to defective teeth. Medical men as well as the laity are only now waking up to the danger to the nation's health involved in this seemingly minor defect. The extent to which defective teeth are found among school children all over the world is appalling. In recent examinations made in this country and in Europe the estimates run from 61 per cent to 96 per cent of the children showing defective teeth. The younger children showed more defects than the older ones, as the milk teeth are more susceptible to attack than the permanent teeth. The age most free from troubles of this kind is about ten years for girls, for boys a little older. The teacher has three duties with reference to this defect: (1) she should teach something of the hygiene of the mouth and teeth; (2) she should coöperate with the home in promoting habits of sanitary care; (3) she should find out whether there are defects if there is no one else to do it, and then do all in her power to get the defects remedied before the child's health suffers.

Speech. — Defects in speech are much more common among school children than one would anticipate. Conradi[2] in his investigation reports 2.46 per cent of children with defect of some kind. Of these lisping, or some form of baby talk, and stuttering are the commonest. Such defects not only influence a child's social adjustment, but influence also his business efficiency. Further, it seems very probable from the study of mentally defective children, the majority of whom suffer from speech defects, that there is a positive correlation between speech and thinking. Clumsy, slovenly,

[1] Terman, *op. cit.*, pp. 173–174. [2] Ped. Sem., 1904, Vol. 11, p. 365.

or halting speech is likely to be accompanied by poor thinking. Improvement in speech has been accompanied by improvement in intellectual power. This need not at all mean that the relationship is one of cause and effect, but it should mean that both parents and teachers recognize that defective speech is not to be neglected or left to look after itself. In only a few cases will this *laissez-faire* method succeed. In most cases the defect grows worse, or at least grows no better, according to the laws of habit. The time for the greatest frequency of the lisping type of defect is just about school age, whereas the stutterers increase in number as the years of school attendance increase. The causes of these two defects are numerous, and the treatment must vary as the cause. Hence the first thing for a teacher to do is to ascertain the cause, malformation of organs, careless habits, defective hearing or motor control, nervousness, or what not, and then plan treatment accordingly. These defects are curable to a large extent (9 out of 10 stutterers are curable, Terman thinks) and the problem is an educational one primarily, not a medical one.

Adenoids and enlarged tonsils. — Adenoids[1] and enlarged tonsils are defects of the throat. They have somewhat the same effect on the health of children, although the former is the more serious mentally of the two. A condition of high-arched, narrow palate, impacted teeth, and nasal obstruction is frequently found together. The signs of these obstructions should be well known to every teacher so that the treatment could begin while the child is young. Adenoids usually appear before the child is nine and the commonest age seems to be six. Removal of the adenoids and tonsils if they are large enough seriously to obstruct the nasal passages, should occur preferably when the child is six or seven. The effect of these

What are some results of having adenoids?

[1] Adenoids consist of the overgrowth or infection of the lymphoid tissue forming the third tonsil. They occur above and behind the soft palate.

obstructions is to cause: (1) irregular and shallow breathing; (2) mouth breathing with its attendant evils; (3) lowered general vitality; (4) defective hearing and speech; (5) a greater frequency of certain diseases by providing fertile ground for infection. Besides all these effects on the health of the child, there is very great reason to believe that the mental development of the child is delayed, so that sometimes he may be permanently retarded. Lack of physical vitality means lack of mental vitality. Deafness, wandering, fickle attention affect mental development. Just what is the relation between these defects and mental capacity has yet to be worked out; but we are pretty sure that the adenoidal child does not develop normally, and there have been some startling changes in mental power and moral character upon the removal of adenoids. But the teacher's duty is not ended when the adenoids are out. There are all the bad habits of the child's life to undo. Many parents and teachers seem to think that all will be well when once the operation is over, — that the child will breathe through his nose, hear the first time he is spoken to, be interested in his school work, — whereas these particular habits of response have to be formed gradually, and the old ones inhibited. It must be made a definite educational problem.

The last of the defects mentioned above is nervousness. The subject of a later chapter necessitates a dealing with this topic, hence it is omitted here.

Malnutrition. — Perhaps the most fundamental handicap from which a child can suffer is malnutrition. This, besides its effects on height and weight, is apt to interfere with development in general, particularly to delay puberty. By lowering the general vitality of the body it increases its susceptibility to any infections, lessens the chance of recovery once a disease is contracted, and increases the danger of a relapse. Especially is it likely to precede tuberculosis, and, in the very young child, to pro-

What are the results of malnutrition?

duce rickets, a soft condition of the bones shown in severe cases by enlarged joints, overgrown head, bow legs, or knock knees. As it is two or three times more prevalent among dull and retarded children than among average or bright ones, we may conclude that it has a deleterious effect on mental development as well.

The causes of malnutrition are not merely an insufficient amount of food, a condition found among the very poor, but a lack of the right sort of food, or of certain constituents requisite in a well-balanced diet. Food that is badly prepared and eaten at irregular intervals or too hurriedly will not serve the child's need, nor will an oversupply of certain articles such as candy, stimulants, and highly seasoned foods. Other physical conditions, such as unsound teeth, a weak digestive system, reflex nervous disturbances including eyestrain, disorders of the lymphatic system, will aggravate the evil of malnutrition; so will also lack of sleep, or of exercise in the open air, and any overexcitement, anxiety, or worry.

A child who is ill nourished usually appears pale and thin, though often the face may be plump but flabby with dark circles under dull eyes. He may be either listless or overexcitable, with other signs of nervousness, particularly twitchings. Decayed teeth, foul breath, and other symptoms of indigestion may be evident at a closer inspection. A teacher on observing a child with manifestations such as these should refer him to a physician for proper examination.

Tuberculosis. — Mention has been made of tuberculosis. Childhood, particularly the earliest years, is the time when nearly all people contract this disease. Many recover from the primary infection without any one's being any the wiser, but a large number retain it to develop later in some form or other. The lymphatic glands or the bones are the most common seat of secondary infection, showing in the familiar swollen neck, hip disease, " white swelling " of the knee, or hunch back. Early diagnosis and treatment is of extreme

importance in such cases; by six years old it may be too late to effect a cure or prevent a deformity. The tertiary or open form so prevalent in later adolescence should of course be forestalled if possible in suspects. Proper hygienic habits and thorough instruction on the topic of tuberculosis are the main safeguards here, with special attention to vocational guidance, general nutrition, and care during periods of convalescence from attacks of scarlet fever, measles, whooping cough, and the like.

Contagious diseases. — Of these and other infectious and contagious diseases little detail need be given here. Any book on hygiene can give the symptoms, the periods of incubation and necessary quarantine, and the teacher should acquaint herself with these. Her better work for the community would be to combat the prevalent idea that these diseases are inevitable and therefore the sooner over with the better. The resultant evils possible from scarlet fever alone are too serious to permit the careless exposure of children to it. One great help in preventing the spread of many of these is, as we are coming to realize, rigid insistence in public and in private on proper care of the secretions from the mouth and nose. Carelessness in sneezing and coughing will soon be recognized as criminal negligence; a sex difference in the need for expectoration will no longer be supposed to exist, so that printed regulations on the subject may disappear as surely as the common drinking cup. Teachers must remember that this is distinctly a matter of educating the public.

Is the school a cause of defects?

The question as to how much the school is responsible for the presence of defects, morbidity, and mortality among school children is still an open one. Particularly here in the United States we have little scientific evidence. However, from all the investigations in other countries, Terman at least is willing to say, "The close correlation of morbidity with years of school attendance, with length of daily program and with the progression of

the school term; the deterioration of attention toward the end of the school year; the damaging effects of strenuous school activities upon appetite, digestion, metabolism, and the constitution of the blood; the ill effects of deprivation from fresh air and from healthy physical exercise; the impairment of nervous coördinations and the profound disturbances reflexly produced by worry, — these and other injurious effects have been sufficiently attested to justify the most vigorous prosecution of reform in matters of educational hygiene." [1] Whether we are willing to go as far as that or not, conditions are such the country over that our individual responsibility in matters of child health is being forced upon us as never before.

Exercises

1. On square-ruled paper chart the table given below (abbreviated from Smedley's norms). Use different colored inks on the same chart to represent the boys and the girls. Arrange your chart thus:

cm.
175
170
165
160
—
—
—
—
—
—
—
—
110

Age	6	7	8	9	10 18

[1] *Op. cit.*, p. 404.

	Height in Cm.	
Age	*Boys*	*Girls*
6	111	110
7	116	115
8	121	120
9	126	125
10	131	130
11	135	135
12	139+	141
13	146	148
14	152	154
15	158	157
16	164	158
17	168	159
18	171	159+

How does your chart show that girls in their early teens are taller than boys of the same age?

How does it show the periods of acceleration and retardation?

2. Spend 30 to 60 minutes in a classroom, noting as follows:

(*a*) how many, and which children have a poor posture habit;

(*b*) which appear poorly nourished;

(*c*) how many have poor eye movements, or hold their work nearer than 10 inches to the eyes;

(*d*) the profiles of any who are unusual in forehead or jaw, sketching them for reference and comparison;

(*e*) any cases of speech defects, any evidence of bad hygienic habits, any asymmetry of ears or eyes.

3. Find out what clinics for children exist within a mile radius of your school.

4. Can you suggest any physical facts that might explain the poor penmanship often found about eleven or twelve years old?

5. By what signs would you suspect the presence of adenoids? What would you, as a teacher, do after thus suspecting?

6. What is one result to the child's own feelings of the fact that bones may grow faster than the muscles and skin covering them?

7. What facts given explain that the rate of growth of height taken sitting differs from the rate of growth of height taken standing?

8. How could you coöperate to educate the parents in the matter of nutrition?

References for Reading

F. Boas, *The Growth of Children.* Science, Vol. 19.
Hoag, *The Health Index of Children.*
Oppenheim, *The Development of the Child.*
Terman, *The Hygiene of the School Child.*
Tyler, *Growth and Education.*

CHAPTER XV

A CROSS SECTION OF CHILD LIFE AT FIVE, AND AT ELEVEN

CHILD LIFE AT FIVE. — So far, the different tendencies have been considered group by group. A study of that kind, analytical as it must be, does not present us with a view of the whole child as we meet him in daily life, complex, changeable, developing as he is, constantly meeting and responding to all sorts of stimuli, varying from mood to mood, from year to year, from home to school environment, in sickness and in health. But neither does constant association with one child give us necessarily any idea of what children of a given age may be like. That one child observed may be atypical, may be very specially endowed by heredity or favored by environment, and is probably considered with prejudiced eyes in all but very few cases. In what follows, an attempt is made to present a sort of cross section of child life at two points, for the ages five and eleven. The facts stated will, of course, be generalized, and may not fit the mental image one calls up of some particular child in many traits; moreover, it may seem to lack perspective and naturalness in the same way that the moving picture's succession of attitudes appears jerky and flat when compared with the scenes with living actors on the stage. However, it may serve as a guide or map in the exploration of the land of childhood.

Physically. — Children at five years old are anywhere from 34 to 46 inches tall, on the average slightly over 40 inches, growing 2 to 2.2 inches during the year. The weight will be from 34 lbs. to 46 lbs. with an average of 39 plus, adding 4

lbs. or a little more in the course of the year. A boy is very slightly taller and heavier than a girl at this age, and grows a little faster than the girl. The sitting height is large, relative to the standing height; the legs are increasing in muscle power rather than much in relative length. The brain has attained about eight ninths of its adult weight, while its development is proceeding rapidly. The sensory neurones are in advance of the motor, of which those neurones controlling the hands are less mature than those controlling the muscles of the trunk and upper limbs. Hands are used for fine precision movements better than are the feet, however.

A child of five. What are the physical characteristics?

At this age children have long had their full set of 20 milk teeth and rarely start to lose even the lower incisors before another year has passed. The first of the permanent set, the "sixth-year molar," makes its appearance about as its name would indicate. Relative to their age, children of five need a large amount of food and at more frequent intervals than does the adult. Their diet should contain 1400 to 1700 calories a day, roughly 36 calories per pound of weight, and include plenty of milk, cooked rather than raw fruit, little or no meat. They need about one half as much fat, and one third as much carbohydrate food as does an adult. They require eleven hours or more of sleep out of the twenty-four, and plenty of outdoor air and sunshine. It is a time of less susceptibility to disease than in the years before three, but still very great compared to the resistance of children ten and twelve years old.

Socially. — Kirkpatrick calls the age from three to six the period of individualization, when children intelligently try to modify other people, their physical environment, and their world of fancy to suit themselves, and, through this self-assertion, develop a personality more independent of others than heretofore, also possibly different from that which they exhibited say at three

What is the social development?

years old. They learn pretty well what is expected of them in the family life, and, with the help of their dramatic imagination, begin to idealize conduct to some degree, using terms such as good, nice, kind, brave, "what — likes." Such moral standards are in process of formation unreflectively, being crystallized from either incidental pains and pleasures or from those administered systematically by the older members of the group to which they belong. Thus their "conscience" is derived wholly from the authority of the surrounding adults, and their moral habits are formed by the law of effect. They learn to be whatever will secure them the greatest advantage, coy, whining, patient and good tempered or vociferous and teasing, shy, obedient, polite, bold according to the value in personal returns which such behavior brings. Right is that which wins the approval of the elders, or which provides the satisfaction of a desire.

Their memory and imagination are developed sufficiently so that hope of reward, dread of ridicule, or fear of punishment can become a controlling factor in conduct. Neither memory nor imagination is a reliable guide, however, when it comes to reporting occurrences. Creative imagination is the generator of many of the so-called lies at this age, faulty perception or memory is accountable for more; but a little training in distinguishing actual from wished-for experiences will be of immense help in straightening out this type of falsification. Conscious and purposeful lying may occur from fear of some loss or punishment, or from a state of open dislike or warfare with unsympathetic adults. A majority of children probably take to lying in some form or other; and to prevent the venture from becoming a habit they should find convincingly, in terms of personal and social results, not only that deception does not pay, but that truth-telling does, even if it is owning up to some piece of mischief or disobedience. Because of the weak time sense at this age, both rewards and punishments need to be immediate to

be effective, and closely connected in the children's own minds with the action. They must be fitted to the children primarily, to the deeds in logical fashion only as a secondary consideration.

Standards to be given. — Moral and social habits reasonably to be expected at this age include regularity and control of bodily functions, coöperation in cleanliness of person, the use of " please," and " thank you " and other simple courtesy forms, handling of spoon and fork simultaneously, use of handkerchief, some inhibition of impulses to cry when disappointed or hurt, of impulses to kick and shriek when angry, of impulses to handle any attractive object known to be either another's property or dangerous, some sustained effort to stop sulks, or crossness, or contrariness, and to be pleasant, polite, courageous. Standards of bedroom and table manners differ so much that it is difficult to be specific. Compare, for instance, children in a typical, two-child, servantless home with parental supervision but many makeshift ways; those in a crowded tenement family with no privacy and no room to sit together at meals; those in an English-style nursery with its careful training; those in single-child millionaire establishments, overloaded with personal service; those in an institution on the congregate plan with the lack of inteliigent, refined interest to direct in these matters. However, children of five years should be made conscious that there is a standard in these things, and their training should have produced an approximate conformity. *What moral stage may be reached?*

One of the chief moral habits needed at this age is obedience, brought about either by personal influence on the emotions or by tangible results in pleasure or the reverse, but in any case secured promptly. Much help can be given here by never offering mere suggestions, which may be disregarded, in the form of commands which must be heeded. This is a bad, thoughtless habit on the part of adults, and necessarily

confuses children who thus have no ready means of distinguishing between occasions when a choice is permissible and when it is not. Their "I don't want to" being met with "Oh, all right then" in one case, how are they to know that such an objection will be a source of contention another time? Fits of obstinacy may be helped by a little letting alone for a while, or by deliberately distracting the attention, as one does for a balky horse, till the inhibitions are released. By auto-suggestion, a child's "I won't" becomes only too literally "I can't," with an accompanying state of high tension; relief by relaxation is needed, which may frequently be secured by something which induces a good laugh. Obedience may then follow more easily, and the child has an experience in control to look back upon, rather than a scarring memory of a conflict with the adult.

Play interests. — The games and plays enjoyed at this age are largely individual and solitary. Children of five will be intent for considerable periods on their own toys, construction work, occupation of whatever sort without desiring the coöperation of others in the way that older children do. Participation by others may frequently be resented and precipitate a fight; whereas seeing others busy with an object excites curiosity and acts as a suggestion to grab and handle likewise. When playing with other children they join in an undefined group, *i.e.* any number can play, and there is an absence of competition. It is play rather than a game with organization and rules. Ring games involving dramatic imagination, with rhythmic movement leading to some climax, especially if accompanied by singing, are popular at this age. Rhythm and repetition in speech and song is a prominent characteristic of the many traditional games played about this time.

What do five-year-olds like to play at?

Another marked feature of their play is the constant activity indulged in from sheer enjoyment of it rather than from any idea of acquiring skill in a movement. Five-year-olds

love to jump, roll, slide, dig, climb, run, pound, throw, lift and use their whole bodies in large movements; but there is no desire to run fast, to throw hard, to jump high, nor to excel the next child in these abilities. Playing in shallow water is a great delight whether in tubs on the veranda, or the small stream, or mere road puddles. Objects that stimulate the senses and can be manipulated are very attractive. Simple toys that will stand hard wear, that are not too liliputian, that offer opportunity for dramatic use or original construction work are the best to provide, especially easily handled variants of blocks and bricks. In using these, girls tend to care for ornamentation more than boys do, while the latter already tend to be more interested in the mechanics side of building. A few simple tools may be appreciated. Other materials also providing scope for the imagination but involving smaller muscles, are such as paper to be cut or torn, clay, colored crayons, the various things found in Montessori or kindergarten rooms, including the sand table. Playing in the snow is sometimes a fearsome pleasure and is not so violent as it becomes four or five years later. Anything suggestive of a cave is adopted rather than constructed at this age; the knee hole of father's desk, a hollow in a bank, empty crates, overhanging ledges of rock, area-ways arched with steps provide cubby-holes all ready for playing house without much further trouble.

Medium-sized dolls, teddy-bears, other animals and their appurtenances are enjoyed by both sexes. The girls may do a greater variety of things with them than boys, and the same thing for longer at a time; also they begin to develop an interest in the details of doll's housekeeping appliances which may bore the boys. Imitation and dramatization play a large part in the activities connected with their toys as also in their other play. They love to dress up and assume the characters they see daily, such as policeman, car conductor, etc., or those they hear about in stories, though this less often.

In this way their imagination is greatly developed. They are interested in fairy tales, but especially in narratives of the culminative type with repetitions such as that of the old woman with the pig that wouldn't go over the stile.

Instincts prominent. — The instincts prominent at five years old are: 1. responses of *sensitivity*, love of sensory life for its own sake but not in the sense of fine discrimination which, of course, only training can give.

Which instincts are most prominent, and in what form?

2. Responses of *gross bodily control*, rapidly developing in the ceaseless muscular plays of this age.

3. Responses of *food-getting* in such forms as pursuing small escaping objects, reaching and putting things in the mouth, cramming the mouth very full with pleasant tasting food, some developing form of collecting and hoarding. Sweet things are generally craved, but acid, pungent or salty flavors are seldom enjoyed. The habitation instinct is shown in the typical response to small enclosures open on at least one of the six sides.

4. *Fear*, occasioned by unfamiliar animals or by people felt as menacing, by thunderstorms, by loud, sudden noises, often by the dark, by the feeling of lack of support in unusual physical positions or in water which is over waist high, or in untried movements that look violent, perhaps by grotesque carvings or even pictures of grim-looking people. There are considerable individual differences here, perhaps innate but partly due to the effects of early training which may have formed the habit of making different responses to situations which might cause fear, or may have intensified the unpleasant emotions.

5. *Fighting* of the types "escape from restraint," "irrational response to pain," "overcoming a moving obstacle," especially "counter attack and struggling against thwarting," accompanied by rage.

6. *Attention-getting*, in the form of restless behavior, doing stunts, calling out, alternating with submissive behavior shown in shyness and self-conscious action.

7. *Emulation*, though in a mild form as compared with the ten-year-old, is shown in such things as the effort to seize what a playfellow is pulling towards himself, struggling to retain a toy, leaving an occupation to run after some other child with an attractive plaything and trying to drag it away. Jealousy may follow with sulking; or if others get the treatment and notice for which they were aiming there is apt to be sulks, howls, or grief.

8. *Imitation* in its simple, reflex forms, working with the general secondary tendency toward suggestibility, renders five-year-olds peculiarly susceptible to emotional influences and to many unconscious tricks of facial expression, gesture, accent, language phrase, and the like.

9. *Manipulation*, which, added to the love of getting sensations, may figure as curiosity, or enjoyment of being a cause.

Other instincts, such as kindliness, motherly behavior, the sex instinct, certain forms of fighting, are not so strong at this age as they are likely to be later. In the case of the sex instinct, this is either in part of the period called by Moll the neutral, or in the period called the undifferentiated, when on the physical side the organs are immature and sensations unlocalized; on the psychic side the children's special affections may be centered on almost any one, even an animal, but chiefly on a parent or some older person of either sex. The curiosity exhibited about their own bodies or the origin of babies is not specifically connected with sex; it is rather a part of general information-getting, and should be so met.

Mental characteristics. — Children of five live in a world fascinatingly "full of a number of things," and they are constantly exploring their environment not only by getting sensations and making movements but by asking questions. Though the previous year may more truly be termed *the* age of questions, the tendency has lost but little of its strength, and, as every parent desirous of living up to his responsibilities knows,

What are the general mental characteristics?

even the latest encyclopedia and the "Child's Book of Knowledge" combined sometimes fail to provide the necessary, satisfying answers. Children's attention is quickly caught by moving objects either seen or heard, but on the whole, things are noticed and considered important only as they contribute to present enjoyment. Voluntary attention is not easy to give, and any kind of attention is quickly distracted. As has been elsewhere indicated, imagination of both the creative and constructive type is very vivid at this age, being a strong factor in determining the type of story or play enjoyed. They begin to imitate not only people and things present at the time, but also those absent and simply remembered. Mere retentiveness is good, relatively, also rote memory; but the memory image is weak and inaccurate, neither is there much ability to recall voluntarily. Logical memory is scarcely developed at all. Color perception is standardizing, but interest in, and memory for, color is far less than has been commonly supposed. Space concepts are fairly well developed for empirical reaction to daily environment, but their time concepts are weak, likewise their number concepts. This condition may be appreciated when we realize how much more frequent are perceptual experiences that involve allowing for space adjustment than are those requiring time measurement; and that beyond small portions of time which can be felt as rhythms, our very terms are abstract. What wonder then that "to-morrow," "last week," "next month" should be difficult to grasp, and that even darkness and light, which can be seen to be understood, do not always satisfactorily explain "to-day," "this evening," still less morning and afternoon. The type of meal soon becomes a fixed point of reference for time of day as do also habitual activities. Prepositions and adverbs expressing space relationship are correctly used at this age, but few expressing time relationships, still fewer dealing with causes, conditions, concessions, and the like. In language development, children

of five may have a vocabulary of from 2000 to as many as 4000 or more words, depending almost entirely on the sort of home environment there is, and also upon definite training including possible ability to read. Many more words are understood than are commonly used in the child's own speech, of course, as with all of us. Substantives and verbs form perhaps three quarters of the entire stock of works used, while some pronouns and any irregular inflections give considerable trouble even when the environment supplies the correct forms constantly.

Mental tests. — The Stanford revision of the Binet-Simon tests gives us an idea of the norm of general intelligence of five-year-old children. They can generally state their own age correctly. Their ability to understand simple instructions and to hold them in mind sufficiently to direct a process of comparison is brought out by the "comparison of weights" test, in which two weights looking exactly alike, but one weighing 3 the other 15 grams, are presented for a sense discrimination test. The same abilities contribute to success in other tests also, as for instance the "three commissions." In this the directions are to take a key and put it on a chair, then to open the door, then to bring a designated box to the experimenter. Most children at this age, if they fail in this test at all, do so from omitting one of the orders. Comprehension and attention are needed again in the "game of patience" test, in which two triangular cards are required to be placed together "so they will look exactly like" a rectangular card which is shown. Control by an idea is involved too, and of course judgment and comparison through the eyes of shape and position. By five years old normal children show discrimination in matters æsthetic by being able to pick out the prettier of two faces in three pairs, and show their interest in the world of color by having picked up the names of the four primary colors without having had any direct teaching in connection

What mental tests can a child of "mental age 5" pass?

with them. Boys are somewhat inferior to girls in this test. Things around them are thought of more largely in terms of use than in terms of general characteristics, so that they will reply to such questions as "What is a table" by saying "To eat on," or "Where to write" rather than giving the fact that it is made of wood, or that it has four legs and a top, or that it is of a certain color and shape. True, they may be led off into irrelevant remarks such as "We have a new table in our parlor," as is readily explainable by the association laws of vividness or recency. For that matter, adults' imagery or mental judgments might well be colored the same way, but the latter would inhibit expression of this type of fact, while five-year-olds do not. Girls may be somewhat, but very slightly superior in general intelligence to boys.

CHILD LIFE AT ELEVEN. Physically.—Turning now to the consideration of eleven-year-old children, we find that at this age they are anywhere from 51 to 58 inches tall, slightly over 53 inches on the average, with boys a very little in the lead. During the year from eleven to twelve girls will start on their period of rapid growth, gaining nearly $2\frac{1}{2}$ inches before their twelfth birthday, while for boys the acceleration has not yet begun. In weight, children of this age tip the scales at from 60 to 78 lbs., girls on the average at 68 and boys at 72. During the year boys will gain about 4 lbs. and girls about 6 lbs., as they overtake boys in height. In lung capacity or strength of grip, however, girls do not measure up to boys. A tall child will begin the period of acceleration rather earlier than a small child; and it will become noticeable in height sooner than in weight. There is a stimulated increase in growth of the bones, especially the long ones, at this period, making a change in the relation of sitting to standing height. The hips and pelvic bones start to undergo changes in the girl which frequently result in a greatly modified carriage and gait.

A child of eleven. What are the physical characteristics?

At this time lack of symmetry may show in the shoulders, hips, sides of the face, use of the hands, and so on. For many girls this marks the beginning of an "awkward" age, when uneven growth not only necessitates new habits of muscle coördination but has its effect in a dawning self-consciousness of a different kind to that previously existing, an increased sensitivity to personal criticism, and an instability of mood which are the forerunners of the metamorphosis that will take place in early adolescence. In both sexes the brain has all but ceased to increase either in size or in weight. The heart is still small in relation to the size of the arteries compared to the relative size obtaining in adult life. The general resistance to disease is high.

By eleven years old the incisors, the first molars, and the front premolars of the permanent set of teeth have appeared, and during the year the canines and back premolars may be changed, though there is considerable age variation here, and again the girl shows more precocity than the boy. Several teeth may be already diseased, especially the sixth-year molars;[1] only one child in five may have perfect, sound teeth at this age, the others having suffered chiefly from lack of inspection and proper care. Children[2] now require about 1800 to 2000 calories in food value daily, or from 28 to 32 per pound of body weight; this would be approximately six tenths as much as a man at moderate work. Their diet should be varied but plain, avoiding rich, heavy, highly seasoned dishes, and being bulky rather than concentrated, so as to somewhat satisfy the almost inexhaustible capacity for eating commonly found. They need at least $9\frac{1}{2}$ hours of sleep during the 24, preferably more; though investigations[3] show that the hours actually spent in sleep average less than this.

[1] See Terman, Hygiene of the School Child, pp. 169 ff.
[2] Rose, Feeding the Family.
[3] Bernhard, Ravenhill, Terman and Hocking. Terman, *op. cit.*, pp. 364 ff.

Socially. — Socially, children of eleven are moving in a world made up mostly of their own kind, vaguely peopled with adolescents and younger children, occasionally touched by the orbits of adults. True, grown-ups are borne with in such necessary spheres as industrial and school life, are tolerated as convenient providers of food, money and other things; but on the whole they are regarded as amazingly far from the interests, occupations, plans and motives of the boy or girl of eleven. Many adult actions and points of view are incomprehensible, at best foolish, at worst unjust, and generally most uncomfortably non-predictable. At no time may there be such complete mutual impatience or even misunderstanding, such falling foul of each other's inclinations and guiding principles.

How has their socialization progressed?

One reason for this is probably found in the fact that though in eleven-year-olds the sense of ownership is well developed so far as their own versus their friends' belongings are concerned, the sense of honor is not yet sufficiently generalized to make them keep from meddling with the property of older members of the family, adults in general or the public at large. Their impulsiveness, imperfect reasoning abilities, wide-awake energy, eagerness to be experimenting, investigating, making things happen, lead them into all sorts of situations which to the unsympathetic adult smack of sheer perversity or willful mischief. Since they are not yet advanced enough to generalize principles of conduct, orders or directions have to be specific; these cannot usually be sufficiently numerous to cover all the possibilities that will suggest themselves to a healthy, active child. Hence the wail from the injured adult, "Who could suppose they would ever think of that?" and from the chidden culprits, "We weren't ever told not to do that"; or "How was I to know they'd object to that? Whatever a feller does seems wrong."

Another reason is that wider reading acquaints children with all sorts of wonder and adventure tales, delightfully

suggestive to the imagination and demanding to be worked out in play. The fields and woods are full, not only of birds and animals, but of probable knights, Indians, pirates, and other vivid beings to whom adjustment must be made; but adults prosaically refuse to recognize the existence of such, except in rare instances. When engaged in strife with burglars, savages, one must needs act violently and express oneself by whoops; it is inconvenient that grown-ups have a different sense of the fitness of time and place, but so it is. Likewise, it is stupid, nay provoking, of older ones not to recognize the absolute necessity for the utilization of all sorts of objects to further the realism of the atmosphere created; it is unfortunate too that they object to the transformation of such articles, but so they do. Inevitably, when behaving at such cross purposes, a certain reticence will be induced. This, with the forced reticence concerning escapades that will be interpreted and rewarded in most variable manner, heightens the difficulty of making explanations in language and widens the gulf of misunderstanding. The adult who can appreciate the real motives at work in children, who does enter into the sport, who is serious and respectful at the right time, who is inventive enough to "play up" may cross a bridge over the gulf into the charmed land of boy and girl trust, love, even adoration.

A third reason for the usual lack of understanding is probably that the common adult impulses expressed in love-making, in industrial and social prudence are not yet vital to eleven-year-olds. They view these activities with amusement verging on contempt, at best assuming an attitude of tolerance towards behavior in grown-ups which interferes with their own purposes. Adolescents are, to them, near-adults in many ways, while younger children, unless they arouse pity and fostering care, are so visibly inferior in prowess that their company is unwelcome in the thrilling exploits which occupy the days for eleven-year-olds. Companion-

ship of their own kind is what is urgently needed and constantly sought. Here there is wordless understanding, common aim, mutual interest, coöperative league against uncomprehending elders and babies. Here there are rivals of one's own sort and size, worthy coadjutors; here there is a true democracy, adjustment to which is the main business in life at this time. Girls do not chum with boys at this age, except in rare instances, nor do boys go in "gangs" with girls, though they may be attracted by some special girl of their own age. In general, there is a distinct drawing apart of the sexes, a dislike for each other's ways, a lack of sympathy with each other's interests. Boys think girls "silly, sneaky," and use the word girl as a term of supreme contempt. Girls find boys "horrid, noisy, rough, messy" and other similar things. No clubs for boys and girls together are likely to flourish; boys respond better to the leadership of one of their own sex than to that of a young girl or older woman.

Moral development. — Kirkpatrick calls this the close of the period of "competitive socialization," when "the sharp corners of individuality are to a considerable extent rubbed off or suppressed, and the individual is made to conform to the rule of social life. . . . Only through companionship with those like himself can the child learn the natural laws of sympathy, ridicule, rivalry, etc."[1] Through this association, children by the age of eleven have developed a sense of honor and loyalty to the group that condemns tale-bearing or lying to one's friends, but upholds the lie to enemies or mere outsiders, especially on behalf of one's friends. They have acquired also a contempt for physical cowardice, an admiration for fearlessness, grit, and ability to endure hardship. They will condemn any abuse of the really little by the big, in spite of the frequent bullying of those not so little, and the thoughtless cruelty towards insects, frogs, and very small

What moral development may be expected?

[1] Kirkpatrick, Individual in the Making, p. 166.

animals. Their sense of justice is strong, especially within the group. Abstract considerations have little weight except as they sum up, perhaps in proverb form, some concrete experience; but, since this is also the age for voracious reading, ideals embodied in the deeds of favorite hero characters in fiction or history may play quite a large part in determining conduct. Tales of action, power, and courage appeal most to a boy, while for a girl, tales of devotion, romanticism, and sacrifice will also have an appeal. The keen desire for adventure, together with lack of personal ratification of civic law, makes predatory excursions of very common occurrence among boys. Activities that may go unnoticed in the country are apt to cause friction in the more densely populated town or city, so that instead of an indignant farmer appearing to give chase, a policeman may arrive to arrest for petty larceny. In Manhattan, during 1912, 1913, from eight to ten per cent of all juvenile delinquents were eleven years old. Nevertheless, this age is remarkably "good" compared with fourteen to fifteen, whether one takes the witness of the police courts or the gradings of conduct by day-school teachers. By them, 70 per cent of the eleven-year-olds were rated as good, in spite of the fact that the sixth grade is proverbially difficult to handle from the standpoint of discipline.

Moral standards. — Moral conduct that may reasonably be expected *if* there has been suitable training is: self-control in the way of willingness to take the lesser good first that future greater good may come, in choosing work before play, in giving up desired objects for the sake of much smaller or weaker ones, in prompt obedience to orders issued in a drill, in persevering in effort at a task in spite of some consequent discomfort, in inhibiting displays of violent temper, in inhibiting — at stated times and places such as social gatherings for worship or other ceremonial — impulses to personal satisfaction at the expense of the group. The sense of honor

should by now include keeping promises, finishing tasks assigned, acknowledging responsibility for deeds, protecting the weak, old, sick, or very young, treating members of the opposite sex in some differentiated ways, punctuality, respect for the property of others in the same age group. Ideals of loyalty to one's friends, to one's family, and to some larger unit, such as the school, the gang, the village, are usually developed, with a more shadowy, remote loyalty to the still larger units. Obedience should be a well-formed habit, yet needs to change somewhat during this year to a more rationalized conformity with social necessities. A conscience is being developed with regard to duty, politeness, kindness. Table manners will reflect the home conditions, as will also the personal, modest habits. An eleven-year-old may have been trained to a very high degree in these matters; and there is no reason for permitting behavior far below the family's standards. Although some supervision will still be necessary, children of this age can be held responsible for the entire daily care of their own persons and immediate belongings, whatever new habits may have to be acquired in the next few years.

Superstition is somewhat on the wane, since there is an increasing interest in practical science, such as physics; yet girls may retain much belief in love-lore, and boys in general good luck. There is a great interest in stories of heroes, and a lack of interest in very brief stories, particularly in those presenting abstract ideals of duty, or some obvious moral. Biographies of adventure, such as David, are favorites in Biblical themes; but here it is unsafe to generalize, since interests and the range of information differ so tremendously with the kind of environment. If the religious teaching has been of the mild type, God is now felt as a watchful Father rather than as censorious parent. In quoting beliefs about heaven, death, etc., there is a greater caution shown by prefacing statements by such phrases as " I have been told that

. . ." "It is supposed that . . ." Children of eleven to twelve are usually heartily averse to having an adult discuss with them anything religious from a personal point of view; and they are profoundly reticent on the subject with their fellows. Exhortations are tolerated only as they are imagined to apply to some one else. Some few girls and still fewer boys have a definite religious awakening at this period. Girls more than boys are susceptible to the influences of color, beautiful music, symbolic pageantry, and the like, in acts of worship, and may even develop a ritual of their own deeply tinged with mysticism. Usually, however, this is reserved for a later age.

Play interests. — The kind of play enjoyed at eleven years old is almost never solitary, but has a strong social characteristic. It is usually in the form of a game rather than free play, with definite rules, a purpose, a beginning, and an end. In type of organization it is generally an undefined group or double group, with a very slight beginning of coöperative teamwork towards the end of the period. Chiefly, however, the feeling of rivalry dominates, each player desiring to "star" in his own part even if the contest is between groups. Sports and games of skill both single and social are in great favor. Children want to see who can pitch a ball hardest, send it highest, jump the farthest, skip longest, run fastest, win most marbles, do the most fancy movements in roller skating, slide most swiftly, etc. The aim in the stunt is usually speed or accuracy, less often ease, least often grace. Running is a prominent feature of a great many games, though girls begin to slacken in this respect. Girls seem to enjoy rhythmic movements more than boys do, and to be more interested in folk dancing, prearranged pageantry, and dramatics. Doll-play is rapidly disappearing, and is probably in the stage of doll-dressmaking, or paper dolls. While girls will be busy with constructive activities allied to home-making, and may be interested in

What is the play life like?

ornamentation, finished detail, and the like, boys are more likely to use carpenters' tools, do simple engineering, experiment with pulleys, levers, electricity, water power, and especially to build some kind of house with whatever the environment offers as suitable material. Guessing games and games of chance are increasingly enjoyed, also the more passive forms of amusement, table games of various sorts, and reading, for which a veritable craze now sets in for many children. Stories of adventure are the chief joy, tales of heroes and their exploits, mystery tales, pioneer narratives, and other thrillers. Individual tastes, of course, come out here, some children becoming veritable storehouses of information on miscellaneous topics, others on historical subjects, others on science, some on poetry, more on merely impossible fiction. The stimulated imagination frequently finds expression in long stories given orally to the inner circle of friends, or in written form; besides detailing episodes of the blood-curdling variety the young authors, or rather authoresses, may try their hands at verse-making. Here, or in plays where a conclave is felt necessary, is the occasion for developing a secret language, from the employment of a shibboleth, password, incantation or what not, to the possession of quite a large-sized vocabulary useful as a barrier between the favored few and inquisitive outsiders. Games involving an intellectual feature are played with interest — such things as acting titles, proverbs, quotations, word-building from long words, checkers and other board games, card games of authors, geography, and so forth. On the whole, children of eleven play a greater variety of things than either earlier when they do not know so many or later when they have lost interest in a number.

Instincts prominent. — The instincts prominent at this time are:

1. Those resulting in *gross bodily control.* A good deal of the play time, as noted above, is devoted to practicing

certain movements, acquiring skill, perfecting accomplishments. Tree-climbing, swinging on rings, skating, bicycle-riding, and swimming are favorite activities that may be instanced in addition to the plays mentioned earlier.

In what form are these instincts shown?

2. *a. Food-getting*, shown in a strong tendency to gorge with food at all times and seasons; in an interest in roughly preparing and cooking food; in hunting and chasing, stronger in boys than in girls.

b. Collecting, which though at its height in the year from ten to eleven, now engages the interest of over ninety per cent of children. They will collect anything convenient and attractive, such as marbles, cigar tags, paper dolls, nature objects, pictures, and vie with each other as to who will have the largest collection. The predatory activities of the gang are also a manifestation of this group of instincts; food is the principal thing taken at this age.

c. Habitation, shown in the housekeeping activities of several forms of girls' play and among boys chiefly in the wigwam, cave, board hut or other gypsy shelter which the gang will construct.

d. Migration. Though not so strong at this age as it is in the teens or even at a much earlier period, it appears in the imaginary plans for going to sea or becoming a bandit, in the delight in stories of discovery in all parts of the world, less frequently in attempts to run away from home, in stealing rides on trains and boats. This may be contrasted with the intense pangs of homesickness experienced by many children when away from familiar places and people.

3. *a. Fear* is manifested chiefly in a sublimated form such as remnants of superstitions, responses to situations such as ridicule of companions, anticipated blame. Girls are probably more timid than boys about such things as going into deep water, dealing with strange animals, getting on high places, being hurt in a fight, touching firearms, and the like,

unless they have been brought up with a good deal of physical freedom and encouraged in rough and tumble sports.

b. Fighting, especially of the counter-attack, rivalry-in-combat types, is exceedingly prevalent among boys at this age. Since it seldom leads to permanent quarrels or alienation and does help to develop fundamental, if crude, ideas of fair play, adults may well refrain from interfering to suppress it. Since when allied with hunting it easily degenerates into bullying, a wise control with substitutions and sublimations is desirable. Girls, less than boys, tend to use feet and fists when this instinct is aroused. They respond more often with indirect attack of language, gesture, facial expression, resorting to pushing, slapping, or pinching when more violent measures are called for. The two sexes very seldom engage each other in actual physical fighting now, though there are occasions permitting hair-pulling and scratching. Males will more often content themselves with jeers, hoots, and cat-calls, females with derogatory remarks to each other about the offending males in their presence, or with quiet planning to outwit them, injure their property, or make them appear ridiculous.

4. *a.* Among the social instincts *tender affection* is more likely to be found in girls than in boys, and in such forms as delight in babies, desire to " mind " them, and in patient care of little children up to about four years old, pride in showing them off.

b. Gregariousness is more marked in boys, and is shown chiefly in the formation of the gang. Although beginning at eight or so, this tendency seems to be stronger in the years eleven to fourteen. Girls, being left out of so many of the boys' social activities, must perforce congregate with members of their own sex; but it is to be questioned whether they seek each other's company as actively as do boys. We have no conclusive evidence on this point. With both sexes it is an age for chums. The particular friend chosen seems to

be the result of casual propinquity rather than conscious selection for reasons of character or temperamental affinity.

c. Attention-getting, display, mastering and submissive behavior are all noticeable, but are not specially different from what they have been. There is a growing desire to mask attempts to attract attention, to feign indifference during acts of display on the part of boys. Towards women, girls may be quite demonstrative where boys will be shy, attempting to conceal the shyness with assumed rough rudeness.

d. So far as the *sex* instinct is concerned, this year falls in the undifferentiated period. On the physical side, since girls mature earlier than do boys, there will be, besides the general spurt of growth, some development of the secondary sex characteristics, and in about four to seven per cent of cases the appearance of the menses before the twelfth birthday. Instruction should include knowledge of this approaching change that there may be no psychic shock when it comes. Boys are probably more widely informed and more misinformed than girls in general sex matters by this age, and are also more likely to have formed undesirable habits. Indeterminate, uncomprehended sexual excitement may be induced by such activities as horseback or bicycle-riding, pole-climbing, sliding or swinging. On the psychic side there is rarely any genuine falling in love at this period. Rather are attractions and adorations casual, part of transient attachments, and felt for members of the same sex as often as not. It is probable that there is never any connection consciously realized between such physical phenomena as may be experienced and the emotional, psychic facts. Love stories are not cared for now, indeed there is a marked impatience with them. Towards the end of the year some few girls may develop a romantic streak remarkably far removed from everyday affairs. Forced into daily companionship with young men not of the family there may be a perfectly child-like, frank chumming, or girls may become restive, shy,

uncertain in behavior, perhaps protectively rude without developing the coquetry or self-consciousness that would be natural at fourteen years old. To be caressed or kissed by such men would be an affront to the more mature, or a perfectly simple matter to the less mature, wherein lies a danger, of course. For a boy to be kissed by a girl would be overwhelmingly shameful. For him to be caressed by a young woman would be felt as indecent and undignified; in some cases there is risk of arousing unexpected instinctive reactions, and the practice is distinctly inadvisable. A big brother in the true sense is what a boy chiefly needs to steer him straight at this time. Both boys and girls are better managed by older members of the same sex. Allied with this instinct may be mentioned the added clothes consciousness of girls, and the budding chivalry towards girls and women in boys.

e. Rivalry is a very strong tendency at this age and enters into almost all play and work undertaken. As noted before, it is individual rather than team rivalry, though the emphasis shifts somewhat during the year. Envy and jealousy are not so strong now as they may be later, and have developed beyond the little child's phase of coveting other toys, clothes, and so on.

f. Kindliness as an instinct comes so often into opposition with teasing, fighting, and rivalry that it does not get much unhindered growth; nevertheless it is there, and is manifested in occasional beautiful outbursts of sympathy, generosity, efforts to relieve, self-denial for causes appealingly presented, thus giving good ground for the development of genuine altruism. In general there is a willingness to share food with those who need or with those who are friends, to help the weak or injured, to do things for the defective, to be glad at others' happiness.

5. Among other instinctive tendencies now prominent may be mentioned *manipulation*, a big factor in many activities besides the plays already noted; *curiosity*, the motive

power for much acquisition of knowledge about concrete physical realities; *language interest*, leading to appreciation of puns, conundrums, ciphers, puzzles, aphorisms, parabolic utterances, to the practice already illustrated of inventing verbal symbols, languages, and the writing of poems and stories, also to the ease with which new languages may be acquired. A *sense of humor* is further manifested in the use of nicknames, in contriving practical jokes, perhaps in the rather frequent and continuous laughter.

Mental characteristics. — Intellectually, children at this age have learned a great deal through their perceptual experiences, they have greatly refined and clarified their perceptual processes, and are still tremendously interested in the physical world about them. Keenly observant of all sorts of details, they are less subject than are adults to such illusions as depend on ignoring things grown familiar through long use. Their school training has emphasized their natural eye-mindedness in the process of learning to read and use books, but even yet it does not appeal to the eye in other ways as well as it might do with objects rather than pictures and diagrams rather than oral descriptions. Still less has it provided for the hands in constructive activities, though to explore thus the use and action of objects is of vital interest to children.

What are the general mental characteristics?

At this age the creative imagination is realistic rather than idealistic; so also is the constructive imagery and the attempt to imitate. The reproductive imagery, in whichever form it is employed, is fairly good at this time in point of accuracy. Memory itself is concrete rather than abstract; but already there are well-marked individual differences in the type of thing best remembered, some children excelling with sensed and perceived facts, others with numbers, symbols, verbal systems, desultory facts, others with associated information about objects. From these facts about memory, and since the time sense is well developed, it is a good time

to teach history as connected, sequential narrative. The interest and memory will center round the deeds rather than about such abstract things as political motives, terms of treaties, changes in constitutions. Again, since the rhythm sense is strong, reproductive imagery good, and muscle dexterity being coördinated, it is a good time to have children of special ability trained at some musical instrument; to start only in the teens is too late, so far as technique goes. Again, since there is a language interest it is an excellent age for acquiring a wide vocabulary in one's own and foreign tongues, for memorizing the more formal aspects of geography, grammar, and the like, as well as literary selections. Verbal learning comes particularly easy at this age, an advantageous fact so far as remembering paradigms, lists of facts, mere words is concerned, disadvantageous so far as the habit of appreciating the meaning of whole passages is desired. Somewhere about now comes the greatest relative increase of immediate memory, though this sort of retention is less good than it is in adult life. The power of prolonged retention is still on the increase, so that, taken together, these two facts explain this " golden age of memory."

The power of forming abstractions is not good, nor is the interest in abstract truth, nor the memory for abstract things. Concepts of time, of space, and of number are fairly well developed within the limits of daily experience and of vivid imagination. On the whole, concepts are chiefly in the form of generic imagery or generalized analogy to some specific instance. As a result, reasoning for reasoning's sake seldom interests children at this age, conduct is seldom generalized, money values need to be personalized, æsthetic and ethical values need to be made specific and concrete.

It is an age when the emotions are strong, the volitional impulses are also strong, but self-control is still weak. Although freedom for initiative in moral, æsthetic, and intellectual fields is very necessary, the opportunity for this must

be restricted and balanced with frequent direction; impartial control is equally important for the developing eleven-year-olds, and is, moreover, appreciated by them.

Mental tests. — In the last revision of the Binet general intelligence tests there is no set for this special age; but a mental age of eleven would be attained by any child passing all the ten-year tests and half those for twelve years, or, of course, nearly all the ten-year tests and scattered tests in the higher ages. Thus he should be able to give the meanings of from thirty-five to forty words from the selected list, indicating a working vocabulary of 6300 to 7200 words. He should be able to detect the absurdities in the test sentences, draw the standard simple designs from memory, give the substance of a simple paragraph read, name at least sixty words in three minutes, and pass the "comprehension tests" of the tenth-year series. At twelve he should be able: (1) to define satisfactorily three out of the five abstract words *pity, revenge, charity, justice, envy;* (2) to rearrange mentally the scattered words of three dissected sentences; (3) to repeat backwards five digits given orally; (4) to interpret two out of five fables read; (5) to interpret rather than merely enumerate the objects in three designated pictures out of four shown; (6) to pass the practical judgment "ball and field" test, and (7) to show power of analysis in naming similarities between certain things.

What are some of the tests for "mental age 11"?

School standards in various countries. — Of added interest are the standards of work expected of eleven-year-old children in schools of different types in different countries.[1] In the French elementary schools children of eleven who had progressed without any setback would be in the first year of the senior

What ability is expected of 11-year-olds in school?

[1] Up to 1914 as far as some of the data are concerned. Details based on commissioners' reports, published syllabi, principal's workplans, also specific studies of Preston, London, and Liverpool, England, and New York City.

division, in the German Volksschule in the Mittelstufe, in England in standard 6, in the States in the sixth grade. In all, about the same group of subjects would be studied, *e.g.* the mother tongue, including grammar, oral and written composition, reading, spelling and dictation, and literature; also history, geography, singing, drawing, easy science, arithmetic, some form of manual or industrial arts, woodwork, cookery or sewing, according to sex and locality; but no foreign language. In Germany and England religious instruction is added, civics in the States. Geometry is begun in France and Germany, is related to arithmetic in England, chiefly to the drawing in New York City. Algebra as far as simple equations is included in England. In arithmetic, children in all four countries study fractions and decimals, some commercial forms, reduction in weights and measures, and mensuration. German children begin percentage, English children are introduced to the metric system, American children spend most of their time on percentage. In the grammar of the mother tongue, German children are busy with irregular nouns, compound tenses, adverbial extensions, subjunctives and conditional moods, with an intensive study of pronouns. English children study sentence analysis and the syntax of all parts of speech. New York City children do not begin a formal study of technical grammar until this year, so take only a rough analysis of sentences, simple inflections, and syntax of parts of speech, excluding verbs.

Eleven-year-olds may be found in some type of secondary school such as the lycée in France, the gymnasium in Germany, the grammar or high school in England, the lower classes of some private school in America. In these last the course of study is so nearly like that of the elementary school sixth grade, except for the possible beginning of one foreign language, that no further comparison of the details for secondary schools in the States is made here.

In France, of children who attend the lycées, a boy of

eleven would be normally in the lowest class of the secondary school with a program of 22 or 23 school hours a week. He will have already studied a modern language for two or three years and may now, according to the type of course he elects, begin Latin. 11 to 15 of his school hours all together will be spent on language, including the mother tongue. His eleven-year-old sister would be in the top class of the preparatory school, getting ready to enter the five-year secondary course proper. She, too, would be putting over one seventh of her time on modern languages, less than that on the two subjects, history and geography, only half an hour a week on any science.

In Germany, rather different programs and standards are used in the various types of secondary schools. A boy going to the Realschule or to the Oberrealschule, or a girl attending the Lyzeum or the Higher Girls' School, would be in the third year of French, but has had no Latin. A boy attending the Gymnasium or the Realgymnasium has had two years of Latin by this time and now begins French.

An eleven-year-old boy in a secondary school in England (not the preparatory schools for the famous " public " schools, but the kind more nearly corresponding to those already described) would be studying both Latin and French, geometry, symbolized arithmetic preparatory to beginning algebra, and nature study — less mathematics than in the elementary school, standard 6, it will be noted. A girl would now begin French if she were transferred from an elementary school, but may have studied it for two years previously. She would begin algebra, take geometry in connection with drawing, begin physics, and continue with nature study in the field of botany.

The following table shows the distribution of periods per week for the different subjects in the various types of secondary schools in the countries discussed. It is less standardized in England than in Germany or France, but typical arrange-

ments are shown. These are, in each case, the arrangements for eleven-year-olds, in school periods, unless stated to be in clock hours.

	GERMANY					FRANCE			ENGLAND			
	GIRLS	BOYS				GIRLS	BOYS		GIRLS		BOYS	
	Lyzeum	Realschule	Oberrealschule	Real-gymnasium	Gymnasium		Course A	Course B		Recommended	Variations in Actual Practice	
Religion or Ethics	3	2	2	2	2	0	0	0	1	1	$3\frac{3}{4}$	$\frac{3}{4}$
Mother tongue	5	5	4	3	3	$6\frac{1}{2}$	3	5	3	6	6	$3\frac{3}{4}$
Latin	0	0	0	7	8	0	7	0	0	?	0	$4\frac{1}{2}$
Modern language	5	6	6	5†	4†	$2\frac{1}{2}$	5	5	4	6	$1\frac{2}{3}$	3
History	2	3	3	2	2	1	3	3	2	3	$1\frac{1}{2}$	2
Geography	2	2	2	2	2	1			2	2	$1\frac{1}{3}$	1
Mathematics	3	5	6	4	4	$2\frac{1}{2}$	2	4	6	6	$4\frac{1}{6}$	$5\frac{1}{4}$
Science	2	2	2	2	2	$\frac{1}{2}$	1	2	3	?	$1\frac{1}{6}$	0
Drawing	2	2	2	2	2	?	2	2	1	2	$2\frac{1}{6}$	0
Writing	1	2	2					2		1	$\frac{1}{2}$	$\frac{3}{4}$
Music	2	?	2	2	2	?			1	?	$\frac{5}{6}$	$\frac{3}{4}$
Manual arts	2									2	2	0
Physical training	2	?	3	3	3	?*	?	?	2	?	$2\frac{2}{3}$*	$1\frac{1}{4}$*

* Clock hours. † Begun. ? Not stated definitely.

Exercise

Gather facts and make similar statements for eight-year-old children.

Questions for Discussion

1. Of what value are such studies as these in this chapter?
2. What statements made would be invalidated by:
   (*a*) great differences in mental age?
   (*b*) differences in physiological age?
   (*c*) racial differences?

3. What good stories descriptive of child life do you know? What makes you think them good?

References for Reading

Kirkpatrick, *The Individual in the Making*, chs. 5, 6.
Pease, *Bible School Curriculum*, chs. 1, 3, 5, 7.
Tyler, *Growth and Education*, chs. 8, 10, 11, 12.

CHAPTER XVI

EXCEPTIONAL CHILDREN

BOUNDARIES OF ORDINARY AND EXCEPTIONAL. — We cannot classify children, any more than we can adults, into discrete groups consisting of ordinary and exceptional. Whatever quality we consider, whatever group of abilities we measure, we find that pupils are distributed along a continuous scale the whole range of which we are perhaps unable to discover. Distribution does not occur evenly along this scale, however, but most ratings of ability cluster around a mediocre point, while the further we look in either direction the fewer ratings are found. Thus, in measurements of the height of a group of adult women of the same race we should find most of them around 5 ft. 3 to 4 inches, fewer between 5 ft. and 5 ft. 3, or 5 ft. 4 and 5 ft. 7, fewer still between these points and 4 ft. 8 on the one hand and 5 ft. 9 on the other, fewest of all beyond these last points. Yet where is the line to be drawn between ordinary and exceptional? And just as we find all degrees of stature rather than distinct groups differing from each other by an inch, so we find all degrees of variability in any trait we examine, blindness, nervousness, morality, or general intelligence, and we must keep in mind that to be " exceptional " is a matter of fine shadings of differences. Just, however, as the dwarf or the giant or the idiot or the genius claim our attention because they are so obviously towards the vanishing point of the possible range of abilities, so it becomes a relatively easy task to describe such extreme variations from mediocrity.

What is an exceptional child?

We must remember always that in proportion as any one departs at all from the conventional standard, these descriptions will fit him in part. Thus, the student may find characteristics of the neurasthenic, the precocious, or the moral imbecile all hereinafter to be described, either by introspection or by observation in acquaintances; but this need not be a disturbing consideration. It should rather make us awake to the value of prevention rather than cure and to the necessity for right treatment, so as to establish poise and adjustment socially.

Neither can there be a hard and fast line between intellectual, physical, and moral scales of measuring. Such are artificial divisions of a unitary individual. Relief of physical disorder may bring about moral improvement or intellectual development; training along volitional and emotional lines may relieve nervous disorders, just as undue pressure may induce them; wise moral training tends to intellectual sanity. However, for convenience sake, we may think of deviations from the normal on the minus and on the plus side in these three fields. Thus, we have criminals, degenerates, moral imbeciles, selfish people, troublesome cases — shading up to the good, those of fine character, the reformers, and the saints. We have also the blind, deaf, paralyzed, diseased, sickly, anæmic, and what not — shading up to the healthy, thoroughly sound, super-energetic among us. We have the idiots, feeble-minded, and so on, shading up to the bright, precocious, and geniuses that exist. It is noteworthy that as so many more causes are likely to bring people down in the scale than to send them up, so our attention has been centered more on those that deviate in a minus direction from what we regard as the norm, and even our nomenclature is fuller here than in the upper end of the range.

How can exceptional cases be classified?

EXCEPTIONAL MORALITY. — Taking the field of morals first, — there are people in whom a moral defect is latent,

who are lacking in any sense of obligation, any feeling of shame or repugnance at thoughts of immoral acts. Children in whom such attitudes cannot be cultivated are potential criminals, though their intelligence may be high enough to keep them from transgressing any legal code. Others exist who form immoral or criminal habits in spite of the law of unpleasant results, who seem unable to check their undesirable tendencies. Certain instincts, such as self-display, bullying, the sex instinct, jealousy, acquisition, may be perverted either singly or in combination with others; or there may be a general instability of control, a high degree of suggestibility and other rather general volitional disorders.

What is a moral defective like?

These divergencies may coexist with all sorts of degrees of intellect apparently. Cases of precocious children are known who vary from being non-social, disagreeable, to being morbidly egoistic, oblivious of the rights of others, possessing tendencies to suicide. Many at the high end of the distribution for intellect show no minus abnormalities of behavior but rather a deviation in the plus direction. On the other hand some few criminals and those of vicious propensities are highly intelligent, while among inmates of prisons, reformatories, and the like, a large proportion of feeble-minded persons are found. Exact measurements are exceedingly scanty here;[1] but Woods and Pearson find a positive correlation between character and intellectual ability of about + .4 to + .5. When moral defectives are demonstrably below the norm in intelligence also they are termed moral imbeciles. They are technically described as persons who display from an early age, and in spite of careful upbringing, strong vicious or criminal propensities, on which punishment has little or no deterrent

[1] Consult Dolbear, Ped. Sem. vol. 19.
Garrison, Burk, Hollingworth. Jour. Appl. Psych. vol. 1.
Woods, Mental and Moral Heredity in Royalty.
Pearson, Biometrika, vol. 5, pp. 105–146.
Compare lives of Chatterton, Rousseau, DeWitte, Goethe, Bach.

effect. If they are of low grade mentally, they exhibit bestial tendencies; if of middle grade they are irresponsible and mischievous; if of high grade they seem to possess a "genius for evil." [1]

Causes. — The causes of these moral divergencies are varied and multiple. Heredity's influence is shown in that large numbers of criminals and delinquents come from neuropathic stock, the statistics available giving a morbid inheritance in from 23 to 77 per cent of the custodial cases.[2] Faulty training may reveal or accentuate bad traits, just as careful training may reduce their potency. Poor environment may stifle the growth of desirable original tendencies, while a good environment may develop to the highest such good heredity as is there. The combined influence of heredity and environment is seen in studies of such families as the Jukes, the Kallikaks, the Edwards.

What causes exceptional morality?

Diagnosis. — The diagnosis of exceptional morality is not so easy as it might seem. For instance, emotional instability with extreme departures from normal behavior may be a temporary condition due to the emergence of long-repressed instincts, or a mere phase of adolescent growth, or a symptom of dementia præcox, or an expression of psychic epilepsy, or the result of an admired companion's influence. A vacillating, weak, day-dreamy condition may be due to hysteria, to malnutrition, to rapid physical growth, to defective sense organs, to a lack of sympathetic fellows, to precocity in love affairs. Fits of perversity may be the accompaniment of an ingrained perversion of instincts, of defective cranial development, of reflex nerve disturbances from impacted teeth, of unusually strict, repressive control. Marked "goodness" is less apt to be recognized, perhaps, since it gives us so little

Who shall diagnose, and how?

[1] Barr, Mental Defectives, p. 90.

[2] Tredgold, Mental Deficiency, pp. 297–298.

concern, involving as it does better social adjustment. The social worker, the parent, the teacher, the physician, and the psychologist may all be needed to assist in the diagnosis of various cases.

Treatment. — Legal control becomes necessary for children of vicious, morbid, criminal tendencies so pronounced as to render them a danger to society. Those not liable to institutional care are likely to cause teacher and parent great trouble. Remedial physical measures under a doctor's advice should claim the attention first, then great care to hygienic living. Intelligence tests may be administered under a clinical psychologist's direction, and a special method of teaching determined upon. The social conditions and relationships need to be investigated. The weak parent who " spoils " the children, the morbidly anxious parent who nags and never leaves them alone, the stern parent who seeks to suppress, the ignorant parent who fails to provide stimuli and results of the right kind, the selfish parent who takes no interest in the children's development — these and others need to be reasoned with. Redirection of instincts and reëducation of habits are generally necessary for the children themselves, with healthy outlet for the imagination, problems of conduct definitely criticized and judged. Experiments in moral reëducation vary in nature from providing the most rigid type of military discipline with autocratic regulation of every detail of life, to conditions of free self-government imitated from democratic institutions. We are not yet sure enough of the results to be dogmatic on the point of which is best in general. For specific children it may be a matter of the degree of mental inferiority which shall decide the policy of segregation and permanent supervision, as in the case of the moral imbecile or psychic epileptic who prove unable to benefit from the exhibitions of social disapproval found in a " junior republic." Or it may be a matter of the degree and kind of moral diver-

How shall the morally exceptional child be treated?

gence which shall indicate the advisability of permanent control, or of assistance in assuming responsibility, self-direction, leadership.

EXCEPTIONAL PHYSICAL CONDITIONS. — Cases of physical divergence from the norm on the minus side will include sense defects, abnormalities in height, weight, rate of growth, and maturing, conditions due to toxic poisoning, nervous disorders of various kinds, conditions due to special injury. Some of these first listed have been discussed in an earlier chapter; some, such as cretinism, will be taken up in connection with feeble-mindedness.

What kinds of exceptional physical conditions should the teacher know about?

Nervous disorders include epilepsy, hysteria, chorea, habit spasms, neurasthenia, dementia præcox.

Epilepsy. *Kinds and cause.* — Epilepsy is known in four forms — grand mal, petit mal, Jacksonian, and psychic epilepsy. The first is marked by fits of unconsciousness lasting from five to twenty minutes, preceded in some cases by premonitory signals; the second by unconsciousness lasting only a few seconds, so that its existence may pass unnoticed. Jacksonian epilepsy is distinguished by localized rather than general convulsions and by no unconsciousness; the psychic form involves abnormal behavior, emotional outbursts rather than rigidity of muscles, and violent spasms, but is like the first form in that the child does not remember afterwards what he did. The immediate cause of epilepsy is a disorder of the motor areas of the brain. Such things as irritation in the intestinal tract, or a tumor pressing on the brain substance may bring on a seizure. By far the greater number of cases are due to poor heredity in which alcoholism, syphilis, or insanity is present. It may be coincident with genius or with feeble-mindedness, with health otherwise good, or with insanity. Frequent and severe attacks bring about mental deterioration.

Diagnosis and treatment. — The detection of epilepsy in the first and third forms described is easy even for the layman,

not always so with the fourth, scarcely ever with the second. In consequence of the difficulty in these forms, much injustice may have been done to sufferers from this disease. True epilepsy is practically incurable. Children subject to it should be taught in special classes, both for their own sakes and to avoid upsetting other children. A quiet, regular life, free from excitement, with plenty of occupation, is what is chiefly needed. Any habits that might increase the general instability, such as the use of alcohol, should be avoided. Sometimes a treatment with bromides is ordered, or, in special cases of the Jacksonian form, surgical measures will afford relief. Epileptics should not marry.

Hysteria. *Characteristics.*—Hysteria is a functional disease resulting from nervous instability, manifesting itself in lessened mental control. Though not developing till middle to late adolescence, the earlier years are important in predisposing to this trouble. The characteristics are chiefly instability of emotional control, abnormal suggestibility, inordinate love of day-dreaming, a tendency so completely to banish unpleasant emotional experiences that they drop out of memory and tend to originate a sort of dissociated personality. Various kinds of motor and sensory disturbances may occur, from simulated epileptic fits to the development of areas of anæsthesia. Real epidemics of hysterical origin are reported to have taken place among school children due to psychic contagion.

Diagnosis and treatment. — Since hysteria may assume the outward form of almost any disease, ranging from deafness, dyspepsia, and the like, to paralysis, it is a difficult matter for even the physician to diagnose it. As mental hygiene is more important for its cure than mere physical regulation, the wise treatment of it lies largely in the hands of the teacher. Sometimes it may be well to remove the sufferer entirely from home influences and give him much outdoor life. Self-control must be encouraged and trained, objective interests sup-

plied to counteract introspection, occupations provided to guard against the dangers of idleness, and, for the more overt symptoms, simple suggestive measures rather than scolding or any talk which draws the attention constantly to them.

Chorea. *Symptoms and treatment.* — Chorea, or St. Vitus dance, as it is popularly called, is a disease commonest between the ages of eight and fifteen, especially prevalent in the spring months, and from two to three times as frequent in girls as in boys. About one per cent of children suffer from it. It is characterized by intensive, uncontrollable jerks and twitches of the face, head, limbs, or sometimes all of them, in severe cases by interference with speech and swallowing. The mental characteristics are capriciousness, instability, poor sleep, perhaps with nightmare. It may come on so gradually as not to be noticed in the early stages; it lasts from six to twelve weeks and may then entirely cease. In most cases there is a history of rheumatism as well as nervous instability, and a majority have heart symptoms also. As the onset is so gradual, it is often not properly diagnosed nor treated early enough. The children are considered clumsy, peevish, awkward, and are perhaps scolded. At a later stage there is little difficulty in recognizing what is the trouble. Choreic children should be immediately removed from school — partly to prevent psychic contagion — and put to bed for absolute rest away from relatives and friends till all symptoms have subsided and there is no danger of a recurrent attack.

Tics. — Habit spasms, or tics, are sometimes mistaken for chorea, but consist of violent contractions of an isolated muscle, or group of muscles, rather than the irregularly distributed, non-predictable jerks of chorea. They represent a functional disorder, probably of the medulla, and are often associated with reflex irritation, anæmia, obsessions, and other emotional complexes. Great effort to control them may result in a temporary cessation, but the spasm may reappear

in some other location. Sympathetic help in self-control is needed rather than severe attempts at repression. If psychic in origin, they may be helped wonderfully by suggestion.

Neurasthenia. *Characteristics and cause.* — Neurotic, unstable children should be specially guarded, since this condition is too often the forerunner of serious mental disorders, including insanity, in adult life. About 5 per cent of children of school age are neurotic, meaning by that that they are sufficiently far down the scale of nervous stability to make them susceptible to emotional complexes which will interfere with good adjustment to the outside world. The chief characteristics may include, on the physical side, headaches, gastric disorders, sleeplessness, uncoördinated movements. On the psychic side we may notice eccentricity, oversensitivity or sometimes its opposite extreme listlessness and indifference to the opinion of others, timidity amounting to fear, oppressive terrors, ready fatigability from any exertion, together with a growing dislike for set tasks, absorption in imaginary situations, rare joining in with other children's occupations, difficulty in reaching decisions. This inner sense of uncertainty, this lack of self-assurance shows outwardly not only in timidity, refusal to face facts, especially disagreeable ones, squarely, but in an apparently opposite characteristic — that of extravagant, aggressive, egotistic self-assertion. Adler explains this predominant characteristic as a "compensation" for the concealed inner state.

Diagnosis. — The tendency to neurasthenia is markedly hereditary, aggravated by unhygienic ways of living such as short sleeping hours, the use of stimulants, much social dissipation, and by unwise training such as narrow repressions, overdevelopment of religious scruples, lack of sound sex education. The diagnosis should, as in the other disorders mentioned, be made by an expert; but the teacher may well watch for symptoms such as those noted above, and for others including inability to sit still or to keep the hands still when

outstretched, extremes of emotionalism, sex perversions, morbidity, excessive day-dreaming, attacks of dizziness, malnutrition.

Treatment. — The treatment must be along the following lines: (1) removal of any irritant causes, such as adenoids, bad teeth; (2) replacing unhygienic living habits by much quiet rest, overfeeding, and outdoor life; (3) habituation to courageous acts, prevention of imaginary fears by quiet reassurance, and a reasoned, sympathetic investigation; (4) habituation to brave moral acts, particularly in facing painful consequences of conduct, accepting failure or blame at face value, deciding about problems rather than evading the issue, and facing difficulties promptly. This may save them from the disturbing influence of repressed emotional complexes; (5) provision of opportunities for social interchange with other children, especially in free play and in all sorts of games. This engenders self-confidence, teaches many moral lessons of cause and effect, gives an outlet for the overwrought imagination, and lessens the chance for an unwholesome withdrawal into self; (6) establishment of impartial adult control, neither vacillating nor strict, which shall train to self-control and steadfastness, which redirects sympathetically rather than endeavors to repress, which encourages a frank relation between the child and the adult so that grief, sex trouble, humiliations, disappointments, and so forth may be confided instead of dwelt upon morbidly, ventilated, so to speak, rather than being left to generate an unhealthy atmosphere; (7) the supply of useful activity, work that shall be interesting and adapted to the child's ability, which will occupy his attention and favor further normal development.

How shall neurotic children be treated?

Dementia præcox. — Dementia præcox is a very prevalent form of insanity which attacks adolescents particularly. Its chief symptom is an aversion to things practical, and an excess of fantastic dreaming which gradually weakens effective

volition so that the individual is content to substitute imagined for real deeds. A poor nervous inheritance is the chief cause of this disease. Full diagnosis is, of course, not the teacher's business; but the presence of the condition noted, in general of "a cleavage between mere thought life and the life of actual application"[1] should arouse the teacher to a realization of the grave danger possible, so that expert advice may be sought. The general principles of mental hygiene apply to the treatment of suspected cases, emphasizing activity and objective interests.

EXCEPTIONAL MENTALITY. — Cases of divergence from the norm in intelligence will include the dull, the backward, the aments on the one hand, and bright, precocious children on the other.

How are subnormal intelligences classified?

Subnormal mentality. — On the minus side the degrees of intelligence grade down through the backward, the moron, the imbecile, to the idiot. Backward children are those whose mental growth is retarded from some environmental condition, such as a disease. Improvement up to normal may be expected if the adverse condition can be removed and special measures taken. Morons are the highest division of the class known as feeble-minded, or, more properly aments, and are defined as those capable of earning a living under favorable circumstances, but incapable, from mental defect existing from birth, or from an early age (*a*) of competing on equal terms with normal people, or (*b*) of managing themselves and their affairs with ordinary prudence. Imbeciles are defined as those who by reason of mental defect existing from birth, or from an early age, are incapable of earning their own living, but are capable of guarding themselves against common physical dangers. Idiots are the lowest in the scale and are defined as those so deeply defective in mind from birth, or from an early age, that they are unable to guard themselves against common physical dangers. Each

[1] Meyer, Psych. Clinic, 1908, p. 96.

step of the scale may be further divided into high, middle, and low grade, so that we may speak of a high-grade moron, middle-grade or low-grade moron, similarly for the imbecile and the idiot.

The above definitions have been in use since 1908, when they were used by the Royal Commission on the Care and Control of the Feeble-minded on the recommendation of the Royal College of Physicians, London. Some confusion has existed, nevertheless, in regard to the use of these terms. In America the designation " feeble-minded " has been popularly applied to cover all three steps of the scale rather than to only the highest step, as in England. There " mental defective " signifies any of the three steps. Norsworthy in 1906, following Ireland, has used " idiot " in the same generic sense. The student will do well to standardize his nomenclature, using " aments " as a preferred generic term for those found in the various stages of idiot, imbecile or moron. Amentia means " a state of mental defect from birth, or from an early age, due to incomplete cerebral development, in consequence of which the person affected is unable to perform his duties as a member of society in the position of life to which he is born." [1] The condition must be distinguished from dementia and from insanity. While in amentia the brain tissues have not developed properly, uniformly, to the normal degree, in dementia they are degenerating, and in insanity they function in perverted manner. (Compare a piece of machinery with some parts missing, some parts worn out, some parts geared wrong.)

Besides these grades of mental deficiency certain clinical types exist, amounting perhaps, taken all together, to about 15 per cent of all cases of amentia. Such are the microcephalic, the mongolian, the hydrocephalic, the cretin, each of which may be found in different degrees and which will be described in its proper place.

[1] Tredgold, Mental Deficiency, p. 2.

Physical characteristics. — The characteristics of aments in general may be considered from the physical and mental standpoints. Physically there is among them a greater prevalence of "stigmata of degeneration" than among children higher in the scale of intelligence; that is, they show more anomalies per individual than do their more favored companions. This does not mean that any are necessarily present, nor that their possession indicates amentia. These stigmata include defects of the palate, delayed and bad dentition, badly shaped ears, nose, lips, a peculiar tongue with considerable slavering; a malformed skull, anomalies of the genital organs, certain skin secretions, poor circulation, stunted growth. Of the special types, the microcephalic has a specially small, "sugar-loaf" head and generally small stature. The hydrocephalic has usually a much enlarged skull. The mongolian is small, has a small skull, flattened face with slanting eyes — hence the name — a large, fissured tongue, broad, clumsy feet and hands with generally a small, incurved little finger. The cretin is greatly dwarfed, with short, bowed legs, badly formed extremities, a protuberant belly, a short, thick neck, large head, eyes wide apart, a flat nose, large, coarse tongue, swollen eyelids, coarse hair, dry, rough skin. The peculiar appearance of these special types should not make us forget that from 80 per cent to 90 per cent of all cases of amentia belong to no special type, and may have no distinguishing physical signs. Paralysis may complicate the condition, affecting the growth of the limbs on one side; epilepsy is another frequent concomitant.

What are the physical characteristics of aments?

Mental characteristics. — The mental ability of aments may be affected by special sense defects; even if not, their sense discrimination is usually weak. On the expressive side, we may notice poor motor coördination, poor control of bladder and bowels, delayed walking, instability of emotions contrasting with almost no

What are the mental characteristics of amentia?

excitability, possibly some degenerate habits arising from perverted instincts such as masturbation, eating filth. Talking is frequently delayed, and a speech defect is common, known as "lalling"; this involves difficulty in enunciating certain consonants, particularly th, r, y, s, g, ng, sh, k, v, l. Considering the higher mental processes they are sluggish in their thinking, are unduly suggestible, have a poor memory span, have little creative imagination. They are so inferior in associative processes that they form habits, or learn, very slowly. Their reasoning is almost non-existent, since they are scarcely able to analyze or to form and to react to abstractions. They have scant power of attention. Of these characteristics, the last few named are the most significant for the teacher to remember. Naturally these abilities are present, or rather absent, in varying degrees, as we descend the steps of the scale.

Cause. — Amentia results, in about 90 per cent of all cases, from hereditary influences. Of these, by far the largest factor is some disease of the nervous system; other less important factors are alcoholism and syphilis. The other 10 per cent of cases result from environmental influences, such as some disease, or alcoholism of the mother during pregnancy, injuries received to the head before, during or after birth, certain toxic poisons resulting from infectious diseases, defective gland action affecting nutrition. More specifically, the great majority of cases of simple amentia of whatever degree are due to neuropathic taint, as is also microcephaly, while the mongolian type is due possibly to syphilis, possibly to "morbid heredity and uterine exhaustion."[1] These may be called primary amentia. Of secondary amentia, due to extrinsic conditions, paralysis may be produced by lesions due to hemorrhage, cysts and tumors pressing on the brain. General amentia, hydrocephaly, or paralysis may result from poisons following diseases such as diphtheria, syphilis, or

What causes amentia?

[1] Tredgold, Mental Deficiency, p. 184.

meningitis. Cretinism is due to a lack of the secretions of the thyroid gland. Other conditions, such as rickets, tuberculosis, deprivation of the senses, may complicate amentia, but it is doubtful if they can cause it. Among other doubtful causes are tuberculosis of the parents, great discrepancy in the age of the parents or advanced age, consanguinity, though these are often mentioned as possible causes.

Diagnosis. WHO MAKES IT? — The diagnosis of backwardness or feeble-mindedness is a matter for the joint action of the teacher, the social worker, the physician, and the psychologist. With the discovery of the lowest degrees of amentia, and with the special types, the teacher has commonly nothing to do. They are the concern chiefly of the doctor and of the institution to which they are sent. It is with the retarded and dull pupils, the "borderline cases," the high- and middle-grade morons that the teacher will come in contact. It is her business to watch for and report cases of children two or three years older than the normal age for the grade in which they are working, and to send them to the proper expert for examination. General intelligence tests are now being devised which may be given to whole classes simultaneously and serve as a rough sieve to separate the less fit from the rest. The social worker might likewise discover cases of children several years behind their fellows in ability, but her chief work is to investigate for environmental conditions which may help the physician in his diagnosis or the psychologist in his prescription of treatment. It is the physician's business to make a thorough physical examination of the selected cases, and to get the family — heredity — history and the personal history of injuries, diseases, dates of development, and so forth, to date. The psychologist's business is to examine the school record of the selected cases to date, and to make a mental examination. Upon the combined results of all these investigations the diagnosis depends, but the final word should be left to the

Who should diagnose amentia?

clinical psychologist, the problem lying mainly in the field of psychology.[1]

HOW DIAGNOSIS IS MADE. — The method of mental examination has been fairly well standardized. It involves giving a series of tests and rating the performance of the child on an objective scale. One such is known as the Yerkes Point Scale. It consists of twenty tests, weighted in the scoring, with a possible maximum score of 100. The average rating obtained by 5-year-old normal children is 22 or more, by 8-year-olds is 39+, by 12-year-olds is 74+, and so on. The score obtained by any child tested divided by the norm for his age gives what is called the "coefficient of intellectual ability"; thus a score of 6 obtained by a child between four and five years of age divided by 15, which is the normal score for that age, gives a coefficient of .40. The "mental age" is determined by finding the age for which the obtained score is the norm. Thus any child of whatever age scoring at 39 has a mental age of 8.

Of what does the mental examination consist?

A better known scale is that devised by Binet, published in 1905, revised by Goddard in 1908, by Binet in 1911, by Terman in 1916. In this the various tests are arranged by age groups, each group representing what 75 per cent of normal children can do at that age. Thus, the VIII group consists of six tests which three fourths of normal 8-year-old children can pass. The groups range in difficulty from what a 3-year-old can do through a 14-year-old level to "average adult" and "superior adult." Each test in each age group is credited with so many points in months. In applying this series, a child of eight who was so scored that his points added up to the equivalent of VIII, would be rated

[1] At present, 1917–1918, the medical profession seem anxious to substitute their work for the psychologists' rather than to coöperate. However, the medical schools offer no training that fits a doctor for expert work in mental diagnosis any more than a general college course fits a layman for the same work, or psychology training fits any one for doing the doctor's work. Feeble body functioning is for one expert, feeble mind functioning for the other.

" at age." His VIII (or mental age) being divided by his chronological age 8, gives the " intelligence quotient " — or I.Q., as it is commonly called — of 100. A child of 8 so scored that his points added to VI is below age. He is of mental age 6 and his I.Q. (6 ÷ 8) is 75. Children whose I.Q. ranges from 90 to 110 are considered normal; if the I.Q. ranges from 80 to 90 they are diagnosed as dull, if from 70 to 80 they are border-line cases. The I.Q. of morons lies from 50 to 70, of imbeciles from 20 or 25 to 50, of idiots below 20 or 25. We may also speak of morons having a " mental age " of from 7 to 11; that is, they never test higher than XI and may test as low as VII. Imbeciles have a mental age of from 3 to 7, and idiots below 3 years.

Treatment. — The treatment of subnormal children depends partly on whether they belong to any special type, partly on the degree of amentia found or the lowness of the I.Q. Good hygienic conditions may check tendencies to disease due to poor circulation and weak digestion. Cretins, if taken very young, can be considerably improved by doses of extract of the thyroid gland systematically and permanently administered. A complication of epilepsy or paralysis obviously indicates specific treatment. For some, tumors may be removed, or other surgical measures employed. Of these, a social safeguard rather than a personal remedy is that of asexualization. This is advisable from the eugenics point of view, since aments have less control of their instincts than normal people, are prolific, and are almost certain to produce offspring with their own deficiency.[1] Considering aments especially, idiots require constant physical care; they are scarcely improvable in any way but may sometimes be trained to cleanly habits. Imbeciles can acquire habits of care of the body, and can learn to do simple industrial work under permanent, close supervision. Morons can benefit by manual training and by intellectual as well; but

What can be done for subnormal children?

[1] In 1914 twelve states had definite laws on this point.

we must remember that they can never be raised by training to the level of normal mentality which has been denied them by heredity. It is useless to try to teach them along with normal children; the pace at which they learn, the methods necessary, and the selected subject matter advisable make it imperative that they should be separated from the regular school classes and taught by themselves. This last remark applies likewise to the border-line cases and to the backward and dull. It must be borne in mind, however, that the merely backward can be so helped by individual attention in special classes that they may be expected to return to the regular school grade and profit by the instruction there. The dull will never catch up to the brighter children, and whether taught in special or in regular classes may be expected to be permanently " retarded " and to drop out of school at about the grade designed for the mental age of twelve.

Retarded development. — From 30 to 35 per cent of school children are retarded one or more years, more boys than girls. The fact of being retarded, that is, being over age for the grade where found, might be due to extraneous causes such as foreign parentage, to having entered school late, to truancy, to much moving about from one school district to another, to periods of illness, or it might be due to real dullness. Opportunity to make up for lost time is what the temporarily retarded chiefly need, and this can best be gained by individual attention in extra, supervised study periods or in the small, special class. For the permanently retarded, those of I.Q. 70 to 90, a pedagogical and psychological examination usually reveals special inaptitudes which will indicate methods of training. In general their small ability to think abstractly or to use creative imagination necessitates a somewhat different curriculum from that of the ordinary school, as well as a slower rate of progress. Omission of abstract arithmetic and grammar, emphasis on concrete facts, sense-training, and industrial work seem to be indicated. Wholesome amusements should be

provided as well as opportunity to learn a trade. Suggestion and imitation should be the chief methods employed, with simple, prompt rewards for efforts and for work carefully done. After leaving school such children need sympathetic social supervision.

Supernormal mentality. *Characteristics*. — Turning now to exceptional children who diverge from the norm on the plus side, we find degrees of ability ranging from the bright up to the genius. There are also special types, such as those with a gift along some one line, for instance mathematics, painting, mechanical ingenuity, music, and the like, which may coexist with mediocrity, superiority or even inferiority in general intelligence. Of these special gifts musical ability shows at a very early age as a rule, often before six years old, and artistic ability in at least the first decade. General mental superiority may, or may not, show itself in children in connection with the usual subjects in the curriculum. Only about 4 per cent of children seem to be "advanced" in school; that is, younger by two years than the normal age for the grade where found, though this may be in part due to our negligence in proper grading. Havelock Ellis has pointed out that[1] the child destined to be eminent intellectually may show only average ability in school while he is simultaneously preoccupied with his own lines of thought; or he may appear simply as an extraordinarily active child physically.

What are the characteristics of mentally superior children?

Precocity, meaning rapid mental growth, does not, contrary to popular opinion, argue unstable mental health, nor physical delicacy, nor early degeneration. By itself, it is rather a sign of ultimate superior attainment. Of course, where a neuropathic taint is present there may come a breakdown, accelerated by the pressure of longer hours of school work, and harder tasks, but the nervous instability is not a concomitant of mental superiority any more than it is of mental

[1] A Study of British Genius, p. 137.

inferiority; it is a separate factor to which the credit should be given in explaining cases of degeneration. As a matter of record, children who are advanced in school work are more often than not taller and heavier than the average for their age, maintain their lead, finish the school course at an earlier age than usual, and are by no means found occupying low stations in life. We ought to be able to go on and say they are always found to achieve eminence in adult life; however, statistics are lacking here. We can reverse the statement and state that eminent adults have usually been precocious as children. It is a matter of common observation that the superior children are generally bright, attractive, alert, "the kind one would like to adopt."

Cause. — The cause of exceptional mental ability is, in ninety per cent of the cases, superior hereditary endowment.[1] Environment may develop wisely what is there, or, more tragically, may work in conjunction with moral traits of laziness and the like so as to discourage full development, but it cannot create what is not originally present. Some few advanced children may owe their position in school to environmental factors such as having begun school at an early age, having used spare time and vacations for tutoring so that added to intensive study they have had a continuous and rapid school progress. The advancement in these cases does not argue unusual intelligence, only unusual opportunity, and is not prophetic of exceptional ability in adult life. It may be that the failure of such to attain eminence as adults has strengthened the fallacious opinion spoken of above that "precocious" children are apt to turn out stupid afterwards.

What produces mental superiority?

Diagnosis. — The discovery of gifted children is commonly left to chance. We are sadly in need of specially devised tests for special aptitudes which shall catch our talented children young enough to prevent their being hindered by training

[1] See Chapter I on this point.

suited to mediocrity given by teachers of only moderate insight. Also, we need to prevent them forming habits of idleness, slack effort, listless attention while performing tasks too easy for them. As an example of what might be done, but is not done, it is interesting to note that Kerschensteiner happened to give drawing tests to the school children of Munich, by which it was apparent that a certain few possessed unusual artistic ability. As a result of this finding, arrangements were made by which those children might receive special training in art from experts in the same line. But had it not been for Kerschensteiner and his research work, those special aptitudes would have gone unprovided for. Similarly for other gifts. Unless the parents are aware of them and are able to allow time for their development, it is likely that little opportunity will be afforded these exceptional children to make the best use of their powers. Yet for their own sakes and for society's best good, we ought to have the means for discovering these special talents, and to apply such tests regularly, at least annually.

How can superiority be diagnosed?

So far as general superiority is concerned, the tests referred to above which can be given to whole classes may weed out the exceptionally intelligent should such not have manifested their ability by the ordinary school ratings. When such are found the test scales already described will give us the mental age, the coefficient of intellectual ability or the I.Q. Any I.Q. above 110 indicates superiority, above 140 the " near genius." About 1 per cent of children only will reach or exceed an I.Q. of 130, according to Terman.[1] It is highly advisable that children of high ability should be early discovered and given every opportunity possible for their best development.

Treatment. — When it comes to the question of how to train exceptionally gifted children, we are yet very much in the dark, with only a few scientific experiments and a great

[1] The Measurement of Intelligence, p. 78.

deal of personal opinion as a guide. Stern has been particularly interested in the problem, and recommends no parading of prodigies, but rather scholarships for study in special schools for children with gifts in some one line. For the generally gifted he advocates a different organization of school grading.[1] It is evident that much further study, both qualitatively and quantitatively, is needed before we can be other than theoretic on the point. Probably a faster than normal pace of study is wise, with attention to intricate, abstract thinking, the stimulation of creative imagination, opportunities for extensive association-forming. Probably, too, such children should be under the guidance of exceptionally gifted instructors from an early age. Obviously, any special aptitude needs to be given full chance for development. It is a debated question whether the ordinary school work should be more intensive than usual, or more extensive, whether precocious children should be taught with others older than they are but of the same mental age, or segregated and given special attention. Other than intellectual superiority matters here. We do not want to interfere with normal social adjustment by separating gifted children from others, but it is not always well to mix immature near-geniuses with adolescent boys and girls of average ability.

What should be done for supernormal children?

PROVISION FOR EXCEPTIONAL CHILDREN. — Many kinds of special schools and special classes exist for the benefit of exceptional children. Such include schools for the blind, the deaf, the crippled, the epileptic, the nervous, mental defectives, truant schools, schools for incorrigibles, open-air schools for the tuberculous or anæmic, schools of music, art schools, technical schools, classes for backward and for gifted children.[2] Of

What provision is there for exceptional children?

[1] Supernormal Children, J. Ed. Psych., 1911.

[2] For comparative statistics with regard to these various types the student is referred to governmental reports, bulletins of the Bureau of Education, special reports of the institutions of the kind mentioned.

these, the first two types were among the earliest to be established, from the manifest need for special methods; provision for open-air work and for supernormal children has been one of the latest developments.

So far as amentia is concerned, institutions for the care of idiots were long ago provided, sometimes, however, in connection with insane asylums. Famous examples are the Salzburg school for cretins, the school at Bicêtre, the Earlswood asylum, the Massachusetts School for Idiots and Feeble-minded Youth. In many such, not only idiots but imbeciles, low- and middle-grade morons, and high-grade moral imbeciles are received. The presence of these has led to the inclusion of formal instruction in some school subjects, by which, of course, mere idiots could not profit. The emphasis is generally on training in industrial arts, agricultural work, speech training, with a minimum attention to the three R's, history, and geography. The majority of border-line, dull, mentally sluggish children are almost never sent to special institutions. Such are the charge of teachers in the ordinary school system, and merit special attention both for their own sakes and for the social good. Classes for such children have been formed in connection with the public schools since compulsory elementary education laws have directed the attention of administrators to the need for them. Beginning in 1867 in Germany, the decade from 1890 to 1900 saw many such classes and schools formed in France, England, and, more lately, in the United States. These classes receive, tentatively, retarded pupils from the large adjacent schools; further testing and training may decide whether given individuals will return to the ordinary school grades, or remain permanently in special classes.

Supernormal children have received less careful attention. A very common custom, and perhaps the least sensible in a closely articulated graded system such as prevails in the United States, is to allow them to skip a grade. Besides this,

there are formed special classes in which a faster pace is possible than in the ordinary schoolroom, so that three years' work may be completed in two, or even two in one. Various systems of flexible grading are still in the experimental stage. One, known as the Cambridge plan, groups all children into slow-moving, regular, fast moving. Each set goes over the same ground but at different speeds, so that the fast-moving group may complete in four years what it takes the regular rate group six years to do. There is provision in this plan for transfer from one group to another at various points. The Chicago system is very similar; but, providing as it does for a threefold grouping within each grade, it is applicable only to large schools. Plans of segregating the brighter pupils are also favored, chiefly for those who have reached a high sixth grade, when by doing departmental work in the next two years they are enabled to save the first of the four high school years. Sometimes this plan is begun lower than the sixth grade.

The next five years or so should see a great development in the provision for supernormal children as we become more sure of the results of the experimental gradings now in use.

Exercises

1. Arrange, if possible, to visit a local institution for truants, or for incorrigibles, or for law-court cases, etc., and note the following points:

(*a*) What sort of motivation is used for good conduct.

(*b*) What type of discipline, government, organization exists.

(*c*) Whether the pupils play normally.

(*d*) What means are provided for normal social development, especially for the adolescents.

(*e*) How the pupils compare with others physically.

(*f*) How they compare in school progress.

Inquire about these facts:

(*a*) What follow-up work is done when the pupils leave the institution.

(*b*) What the statistics show as to the percentage making good after they leave.

2. What types of special schools exist in the town where you live?

3. What does your State provide in the way of special institutions for exceptional children of any kind?

4. If convenient, observe the expert administration of a set of mental tests to a child of exceptional mentality. Compare the physical condition of such child with the normal.

Questions for Discussion

1. Recall the facts of chapters VII and XIV. Summarize what physical troubles are more prevalent before twelve years old, — in the teens.

2. Recall the facts stated in chapters IX, XIII, and XV about adolescent day-dreaming; compare with what is said in this chapter. What conclusions do you draw?

3. Just what should you do if you suspect that a child in your care is exceptional? Discuss this from as many points of view as possible.

4. Recall recommendations from the study of eugenics which have a bearing on the topic of exceptional children.

5. Should more time, energy, care, money be spent on children of subnormal, or of supernormal intelligence? Why?

References for Reading

Goddard, *Feeble-mindedness, Its Causes and Consequences*, chs. 1, 3, 4, 9, 10.

Pyle, *The Examination of School Children.*

Tredgold, *Mental Deficiency*, chs. 3, 5, 7, 12, 21.

Dolbear, *Precocious Children*, Ped. Sem., Vol. 19.

CHAPTER XVII

METHODS USED IN CHILD PSYCHOLOGY

CONTENT DERIVED FROM OTHER KINDS OF PSYCHOLOGY.—Since Child Study is but one branch of psychology we should expect to find in it elements, both of facts and methods, which are common to the other branches of the science; and so we do.

What are the contributions of other branches of psychology to child psychology?

So far as content goes, we get from *general* psychology our points of departure in investigations as to the differences between adults and children, our phraseology and classifications in describing the kinds and amounts of differences found. From *social* psychology we get facts about man's development among his fellows and his reactions to them that help us understand much of the instinctive behavior of children. From *animal* psychology we get knowledge about reactions in mammals and primates that helps us realize truths not only about instincts but also about the learning processes of children. From *abnormal* and *pathological* psychology we get, in addition, information which assists in the diagnosis of backward and feeble-minded children, which indicates the line of treatment for the mentally deranged adolescent or those in any way atypical, and which helps establish norms for the ordinary child at different stages. The allied sciences of anthropology, sociology, and physiology also add to our knowledge of the development and growth of children socially, industrially, spiritually and physically, giving a key, through the study of heredity, to much of the general behavior and special aptitudes or deficiencies in any given child. Child study in its

turn makes its special contribution to educational psychology: since to direct the kind of changes desired in educating children, or the rate and method of making such changes, it is necessary to understand the nature of the beings in whom we endeavor to bring about these changes.

METHODS COMMON TO OTHER KINDS OF PSYCHOLOGY. Introspection. — So far as methods are concerned, since introspection is the final court of appeal for many truths about mental states, it is but natural to look for it in some form as a method of child study. Quite obviously this is an impracticable method to use directly with very young children; indeed, even at ten years old it is difficult to make many understand and describe what is wanted. As a derived method, we find adults recounting childhood experiences in so graphic a manner that the readers may feel instantly the ring of truth in the interpretation, or detect the exaggerated strain for effect, or revolt at the namby-pamby didactic incorporated. But however interesting and true to life these reminiscent accounts seem there is the undeniable inaccuracy of memory both in the making of statements and in the joyful acceptance of them. We know how testimony is increasingly falsified by factors such as lapse of time, the presence of a desired coloring of events, the mere repetition of a narrative; and the subjective feel of the early life of even expert writers must likewise be distorted by these same facts. Nevertheless, some authors who combine sympathetic observation with vivid memories of events and emotions may produce tales which have great value in opening the eyes and understanding of many adults who are puzzled by children's conduct and who have largely forgotten "how things feel when you are small." Such books as "Emmy Lou," "Anne of Green Gables," "Paul and Fiametta," "The Treasure-Seekers," "Little Citizens," "Penrod," "The Madness of Philip," "Phœbe and Ernest," "The Golden Age," "Understood Betsy," not to mention

Is introspection a method used in child psychology?

hosts of others, may awaken not only a responsive thrill, but a more tender appreciation of the inner working of the child mind. They will always have their place in the reference library recommended for parents and others interested in the study of children.

Reminiscence. — Besides this literary form we have definite autobiographies such as those of Goethe, De Quincey, Tolstoi, George Sand, Marie Bashkirtseff, John Stuart Mill, Mary Antin, and many others. Here again, both the accuracy of the facts and the validity of the interpretation are open to the same criticisms as are expressed above. Moreover, we feel that people as exceptional in adult life as these may well have been exceptional as children, and therefore representative of only certain types of childhood. We need further introspective reports from still other nationalities — studies that could be more of a guide to missionaries and teachers in foreign countries, reconstructionists after the war, social workers among the foreign population of our cosmopolitan cities. Boys such as Tom Sawyer, David Copperfield (Charles Dickens largely), and Rabindranath Tagore seem very far apart by nature as well as by nurture.

Questionnaire. — Another form of the introspective method is sometimes seen when the questionnaire method is employed. As late adolescents are frequently used as subjects, there is a certain amount of retrospection as well as introspection. These young people, untrained as they are in the method necessary, are more prone to errors in accuracy than are thoughtful, observant adults, and are specially likely to be misled when reporting on whole sets of experiences in rather general terms. As Thorndike[1] points out, the questionnaire is usually sent to special groups, in normal schools, for instance, which are conveniently handy but do not represent the general population by any means. Moreover from this selected group, only those interested and therefore probably biased,

[1] Thorndike, The Original Nature of Man, pp. 29–37.

may reply unless there is compulsion in the matter, when the very reluctance for the task may bring about a casual, careless, even mischievous response that still further reduces the reliability of the answers. The questions may be so phrased as to be a strong suggestive force. Further, of the few who do answer, scarcely any answer all, and many misunderstand some of the questions. To offset these disadvantages investigators have usually had recourse to the supposed safety of numbers; but, again Thorndike suggests, there is a fallacy in concluding that ignorance, even if multiplied, is anything more than just ignorance. Moreover, the investigator, in the absence of any means of verification, is left to his probable misinterpretation of the replies; and, unless specifically trained as a statistician, may mislead the reader by his published averages, graphs, and other generalizations.

In spite of the enumerated disadvantages of the questionnaire method it is frequently used both for introspective work, as here indicated, and for simpler replies of fact from all sorts of people. Examples of this method of studying children are to be found in great plenty in the earlier numbers of the Pedagogical Seminary, and include such topics as the collecting instinct, adolescent ambitions, gangs, conversion experiences, doll-play, motor ability, ownership, the teacher's influence, interests in reading, exceptional children, imagination, moral influences, ideals etc., etc. It is perhaps the method that first occurs to persons who are in quest of information; for it seems so simple to interrogate people directly, so praiseworthy to ask large numbers of them, so valuable to employ printed forms. Its function, if carefully used so as to minimize the causes of error as stated above, is to give us a rough trip over the ground, so to speak, with impressionistic reports by the guide, which may suggest the aims and methods of the later, more careful, measured survey.

Observation. *Free activity or directed response.* — Besides introspection as a rather doubtful method of child study we

have, of course, observation carried on in various ways. There is first of all the unostentatious observation of one child or many during free activities. Thus we may "take X under observation" for a few weeks or months for purposes of diagnosis of moral tendencies or nervous condition. We set the child no definite task, hold no prearranged conversation, but watch and record all that seems pertinent to our purpose. Similarly we may observe children of a given age or neighborhood at play, or watch their behavior in a public library, at the circus, when in certain new situations. Data secured by such means will be definite enough for statistical treatment if the purpose of the observation has been clearly formulated and analyzed. A study of this type is Sisson's account of the playground activities of 29 kindergarten children.[1] Another is Hall's "Story of a Sand-pile."[2] In contrast to this we have a form of observation which seeks for some definite expression from the child or group, it may be in the form of a drawing, or a composition, or simple answers to questions. Of this type is Hall's[3] work to determine the contents of children's minds when they enter school, Binet's[4] work with his young daughters to determine the mental type of each, Stern's work[5] with the report test, and so on.

What other methods are utilized?

Extensive or intensive. — Observation may also be classified as intensive or extensive. The first concentrates on one child for a considerable period of time either to get an idea of the general development of the period, as Preyer's,[6] Darwin's,[7] Shinn's[8] studies of infants, or to get data on one specific topic, such as Whipple's[9] study of the vocabulary of a three-

[1] Barnes, Studies in Education.
[2] See Aspects of Child Life and Education.
[3] *Ibid.*
[4] L'Observateur et l'imaginatif. A. P., 1900, Vol. 9.
[5] Stern, Zur Psych. d. Aussage.
[6] Preyer, The Infant Mind.
[7] Darwin, The Expression of the Emotions in Man and Animals.
[8] Shinn, The Biography of a Baby.
[9] Ped. Sem., Vol. 16.

year-old. In contrast to this we have extensive observation of large masses of children in which we get numbers of facts about physical standards such as lung capacity, percentage suffering from bad teeth or impaired vision. Or it may be about mental abilities, such as the possible correlations of ability in languages and mathematics, or the percentage of promotions. Simple examinations and measurement of conditions found, the use of school grades and census reports — such are the data used here rather than any direct test.

Experiment. *Qualitative or quantitative.* — An increasingly frequent form of observation is the definite experiment, where conditions are controlled in advance, special tests devised, themselves tested and refined and used perhaps to establish norms, or to diagnose a special case, or to measure results of teaching. These may be mainly qualitative, as in Binet's [1] work on the description test, where with simple directions, children's compositions about an object placed before them are examined, compared, graded and classified according to the type of person revealed. Often we have a mixture of qualitative and quantitative results as in a test for memory of ideas. Sometimes it is mainly quantitative as in a memory span test. The observation may, further, be directed to the measurement directly, such as getting a work curve for some muscular act, or in testing rapidity of adding, range of attention, transfer of training. Again, the tests may be used as an indirect measure of some totally different factor such as the influence of temperature, ventilation, or the weather on performance, or to determine the fraternal resemblance of twins. Rightly to administer such tests and to treat the data so secured requires special training. The ordinary teacher may be asked to assist, perhaps, in some simple procedure, or to coöperate when some widespread Work Commission is at work in many places simultaneously; but she should not attempt independent re-

What forms may experiments take?

[1] Binet, Psychologie individuelle. A. P., Vol. 3.

search in this line without being well versed and drilled in the necessary technique of test-giving. As Myers [1] says: "I want to protest as strongly as I can against the notion that any useful purpose can be served, so far as psychology is concerned, by collecting masses of psychological data with the help of an army of untrained observers. . . . Nothing . . . can be more dangerous or false than this idea that the untrustworthiness of crude methods diminishes as the number of observers increases."

And again Rusk: [2] "Doubtless teachers will have but few opportunities of accomplishing original research work in Experimental Education. This requires a training which cannot form part of the ordinary professional course, and the time demanded by research work can hardly be given by one engaged in the routine duties of a teacher."

Tests and scales. *Purpose of scales.* — Two special forms of tests are at present interesting to those who deal with children. One is the recent development of various scales by which to measure ability and progress. The up-to-date teacher will utilize such standardized procedures as the Courtis Tests, the Stone Tests, and the Woody Tests for measuring their class achievements in arithmetic, the Handwriting Scale devised by Thorndike, the Ayres Spelling Scale, the Hillegas Composition Scale, the Harvard-Newton Scale, the Kansas Silent Reading Test, Thorndike's reading, vocabulary, and drawing scales, the Trabue Language Scale, and others that are being arranged.[3]

With what scales should a teacher be familiar?

By the application of tests such as these we can discover

[1] C. S. Myers, The Pitfalls of Mental Tests.

[2] Rusk, Introduction to Experimental Education.

[3] Courtis Tests, Series B. Courtis, Detroit, Mich.

Ayres Spelling Scale. Russell Sage Foundation Publications, New York.

Kansas Silent Reading Test. State Normal School, Emporia, Kansas.

Harvard-Newton Scale for the Measurement of English Composition. Harvard Univ. Press.

Arithmetic Scales. Clifford Woody. This and the rest published by Teachers College, Columbia University, New York City.

the kind and amount of improvement brought about in a group after a given period of teaching, and thus be in a position to judge whether or not our methods of instruction need overhauling. We can also rate children by a fixed standard rather than by one peculiar to the teacher, the school, the neighborhood or the part of the country. Comparisons of racial differences will be more objective along these lines, also. The scales are in such form that any teacher can speedily get the knowledge of how to employ them.

The other well-known tests are the Binet-Simon [1] mental age tests, the less familiar Yerkes [2] point-scale, and the Pintner and Paterson [3] tests.

Training in administering tests. — Only those persons who have been trained to administer these should undertake to test children for any ulterior purpose. Of late, a number of enthusiasts have been at large in the country "doing Binets." If this were for their own experience that might not be so bad; but since physicians, immigration authorities, judges, and others have occasion to utilize the results of this form of work and on the basis of the diagnosis render decisions that may affect the whole future of the individual tested, it presents a grave social danger. It is sheer charlatanism for a college or normal school graduate who has read a book on the tests and seen a subject tested, to set up as an expert in this line. No one would dream of sending children to a quack dentist whose

Who should administer the mental tests?

Standardized Reasoning Tests in Arithmetic and How to Utilize Them. Cliff W. Stone.

Drawing Scale for Grades 5 to 8. E. L. Thorndike.

Nassau County Supplement to the Hillegas Scale. M. R. Trabue.

Handwriting Scale from Grades 5 to 8. E. L. Thorndike.

Language Scales. M. R. Trabue. 8 scales.

Improved Scale for Measuring the Understanding of Sentences: Scale Alpha 2, parts 1 and 2. E. L. Thorndike.

Improved Scales for Word Knowledge or Visual Vocabulary. E. L. Thorndike Scale A_2 and Scale B.

[1] Stanford Revision of the Binet-Simon Intelligence Scale. Terman.

[2] A Point Scale for Measuring Mental Ability. Yerkes, Bridges, and Hardwick.

[3] A Scale of Performance Tests. Pintner and Paterson.

sole training had consisted of reading a little about dentistry and in watching a few processes of the profession; why then should children be sent to a quack psychologist whose preparation is equally scanty? Again, just as in other professions, say medicine, a person is expected to take first a general course, two years of college work at least, then to train for professional work, lastly to specialize in some particular branch of that, say throat and ear work; so one who aspires to be a clinical psychologist should take first a general higher education, then a thorough course in the general field of psychology, descriptive, pathological, experimental, educational; and only then specialize as a worker in the clinic. Even so, such an expert needs to work in close touch with a psychiatrist, since the level of mental ability is not an efficient index to many forms of mental trouble. Similarly, to use the elaborate statistical method which is necessary to deal adequately with the facts collected in experimental pedagogy means not only the devotion of more time to it than the teacher engaged in routine duties can afford, but also a very thorough, intensive preparation.

Such are the methods of child psychology, which serve its purpose of amassing information about children's natures as distinct from adults'. Its scope may be widened to include studies of child life on the physical side in connection with eugenics, infant mortality, tuberculosis, and the like; on the social side in connection with housing conditions, delinquency, dependency, child labor. Its main contribution is to the applied psychology of child-training and methods of instruction; in short, to the science and art of education.

Exercises

1. Extend the list of works of fiction given in the early part of this chapter. Add author and publisher.

2. Look back over the exercises suggested in this book. Under which type of child study would fall the various things you have been asked to do?

3. Go through the footnote references in this book to different studies made of childhood. Classify them as above.

4. Go through the list of authors given below. Check off those you know. Add titles of papers or books they have written that have to do with child psychology.

5. Verify your additions. Look up from any good catalogue facts about those you didn't know. Extend the list of titles for the starred names. Add publisher (and price if possible).

6. If within reach of a large library, look up a dozen of the books you did not know; add descriptive remarks.

7. (*a*) Select from your total, completed list, eight volumes you would recommend some one with limited means to get as a *general* child-study library.

(*b*) Select a library for a missionary going to India.

(*c*) Select the best four to give a young father.

(*d*) Select thirty for the library of a women's college.

Addams	W. S. Hall	Rowe
Adler	Eliz. Harrison	Rusk
Appleton	Hogan	Shinn
*Ayres	Holt	Slattery
*Barnes	G. E. Johnson	Slaughter
Binet	Irving King	Starbuck
Chamberlain	*Kirkpatrick	Sully
Chenery	Lancaster	Swift
Coe	Lee	Tanner
Dawson	Lukens	Taylor
Dewey	*McKeever	Terman
D. Canfield Fisher	Mangold	*Thorndike
*Forbush	Moll	Travis
W. T. Foster	Mumford	Tyler
Gesell	Norsworthy	Whipple
Goddard	*O'Shea	Winch
Gruenberg	Oppenheim	Wood Allen
Gulick	Preyer	Woods Hutchinson
*G. Stanley Hall	Pyle	

8. List the agencies in your town that have to do with child welfare. What others do you know of?

9. Send to The Children's Bureau, Washington, D. C., for its catalogue of publications.

10. What periodicals act as organs for child study or child welfare institutions? (Consult librarian for a full list. Check off those you know.)

11. In what way could the following help you in fostering public interest in child life?

The Russell Sage Foundation, New York City.

The National Child Labor Committee, New York City.

The Eugenics Record Office, Cold Spring Harbor, L. I., N. Y.

The National Child Welfare Exhibit Association, New York City.

Better Babies Bureau, % Woman's Home Companion, New York City.

Society for the Prevention of Cruelty to Children (local).

Write to any of the first four for leaflets, information, or advice.

Questions for Discussion

1. Compare and criticize the lists compiled in exercise 7.

2. How does the work of the agencies listed in exercise 8 correlate? Overlap?

3. What city institutions should be correlated with a Child Welfare League?

4. Besides the teacher and the judge, for whom else would you recommend child study?

5. Where besides school and home is a good place to study children?

6. What would be the difference in aim and methods between a mothers' club and a parent-teacher association?

7. What sort of work can a parent-teacher association undertake?

8. In what form of child study would parents most likely be interested? Why?

9. How can the faults of the questionnaire method be to some extent avoided.

10. Describe the attitude desirable in a person who undertakes to observe children.

11. What sort of work has The Children's Bureau at Washington undertaken in the last five years?

References for Reading

Rusk, *Introduction to Experimental Education*, ch. 1.
Mangold, *Child Problems*, ch. 1.
McKeever, *Outlines of Child Study*, Part 1.
Claparède, *Experimental Pedagogy*, chs. 2, 3.
Partridge, *Outlines of Individual Study.*
Forbush, *Guidebook to Childhood*, pp. 1–6, 503–525.

(The following section is intended for those who wish either a better understanding of such statistical terms as they may commonly meet in any journal of child study to-day, or a tentative acquaintance with the simpler usages. For an adequate study of measurements the student is referred to a full textbook on the subject. Chapter 3 of Whipple's "Manual of Mental and Physical Tests" gives a fuller explanation of many measures than is attempted here.)

STATISTICAL METHODS. — In considering groups of children relative to some standard, or a series of similar measures on the same child, at least the following points are to be noted:

What statistical facts about a group of measures should one know?

1. the number of cases.
2. the range of the measures.
3. the meaning of the unit of measurement.
4. some central tendency around which the measures are clustered.
5. some convenient index of the deviation of the measures from the central tendency.
6. some comparison of the whole set of measures with other sets of the same kind of measures on another group of people.
7. a measure of likeness, of resemblance of different measures made on the same people.

These will be discussed in the order given.

1. **Noting the number.** — First. It makes a great difference in crediting statements about a proficiency whether they are based on a study of fourteen cases, forty, or four hundred.

Similarly in computing the scores of arithmetic papers we should want to know whether we had thirty or three hundred to deal with; or in testing a child whether he repeats six words or sixty. The *n* is therefore the first measure to be stated.

2. **Noting the range.** — Second. The range of abilities measured is important. In a class of children adding examples in a limited time some may finish only three examples, others do as many as twenty. In another group there may be a narrower range, of from five to seventeen examples finished. The range of age in a given grade may be from nine to fourteen years old, or from nine and a half to twelve and a half. Either way, it will make a difference in the practical handling of a group if the range is large or small. Then again the range of a child's grades in one subject may be from 40 per cent to 90 per cent, in another subject from 80 per cent to 95 per cent. In every set of measures, then, we should know the range over which they are distributed.

When dealing with all sorts of scores, having counted the *n* and observed the range, the first thing to do is to rearrange the scores in a serial order. For example, after giving a test to a high school class in algebra let us say, the roll book would show the scores entered opposite the names. As these are in alphabetical order the scores come quite haphazard, something like the following, let us suppose: 80, 75, 70, 60, 75, 85, 70, 65, 80, 70, 60, 75, 65, 85, 65, 70, 55, 70, 75, 50, 80, 75, 70, 80, 70, 65, 75, 70, 90, 70, 85, 75, 65. Counting these, we see that *n* is 33, and the range from 90, the highest, to 50, the lowest score, running by steps of five. The next thing is to arrange these. The most convenient way to do this is to space the range of scores along a horizontal line in serial order beginning with the lowest; then place a check mark above each as it occurs in reading off the list above from the separate, dislocated records. By using quadrille ruled paper these check marks can easily be kept aligned. In this case we get from the record:

What is a quick way to tabulate?

Illustration 1.

or

50	1	case
55	1	case
60	2	cases
65	5	cases
70	9	cases
75	7	cases
80	4	cases
85	3	cases
90	1	case

This method has the advantage of being very rapid. By using a heavy check mark for every fifth in a vertical line, or by barring five together, it is easy to the eye to count up the number of cases at each score and so give the data for the table of distributions given. By drawing a heavy line round the irregularities one has a picture of the distribution curve, and the complete graph of the distribution. By starting the table with the lowest score, we now have the low end of the distribution curve to the left, as is customary.

Exercises

Find the n and the range, and tabulate as shown, drawing the graph. Use square-ruled graph paper.

1. These are scores used instead of percentage ratings: A

means excellent and F failure. C C B D C B B C B D D C E D F C E D A C A D C C B.

2. These are the ages of children in a fourth grade. 9, 8, 10, 9, 11, 9, 11, 9, 9, 10, 9, 10, 9, 7, 11, 9, 10, 9, 10, 9, 9, 8, 9, 10, 8, 9, 11, 10, 11, 10, 9, 10, 9, 11, 8, 10, 11.

3. These are scores of amount done in an addition test.

17	20	23	20	23	17	20	29	23	17	32	23	26
23	26	5	23	14	29	23	17	20	11	14	20	23
14	17	20	17	20	11	26	8	23	20	23	11	17
20	23	17	11	26	20	20	23	32	23	26	29	26
26	20	23	29	23	32	26	29	17	35	20	26	23

3. **Meaning of units used.** — Third: as to the meaning of the scores. In the first illustration just what does a score of 80 represent? Primarily an artificial value attached by one teacher to a piece of work. Another teacher with another range in mind might rate it 65. In any case it probably does not mean that it is equidistant from 60 and 100, nor twice as good as a score of 40 would be, nor the exact equivalent of a B− in another system of scoring. These are subjective units, arbitrary values, measured down from a standard of perfection rather than up from a definite zero point. Much of the present work in mental measurements involves devising scales as objective as possible, and determining the values of the units employed.

Still another question arises, affecting not only the interpretation of a scale but certain calculations within it. 80 means at least 80 but not as high as 85, since the step in this illustration is five; we should think of the ability it measures not as discrete but as continuous from 80 to 84.9, in fact. But in exercise 2, age 10 may mean either all children who have passed the 10th birthday, or all children whose 10th birthday is the nearest. (As a matter of pride, parents whose child is almost 10 will prefer to record him as 10 rather than 9.) The score then may mean from 10 to 11, or from $9\frac{1}{2}$ to $10\frac{1}{2}$; whichever it does mean should be clearly stated to any one using the table.

4. **Central tendency.** — Fourth. On examining any normal grouping of scores in either the table or the graph, it will be seen that they cluster about a central point and are less and less frequent towards the extremes of the range.

The mode. — One measure of the central tendency little known but quite frequently intended is the *mode*. This means, as its name implies, the fashionable, modish score, that which most people get, which occurs most frequently. A mere glance at a table shows the greatest frequency in the column of frequencies, and the score opposite this is the modal score. Thus in Illustration 1, the highest frequency is 9, and the score gained by them is 70; the mode therefore is 70, since more pupils get that score than any other. In exercise 15 below the modal score is 5. In the graph, since the most elevated point represents the greatest number of cases, the score marked in the base line directly below this point is the modal score.

What is the mode?

Exercises

4. Name the mode in exercises 1, 2, and 3 above.

5. Name the mode in the following table (taken from Thorndike, "Mental and Social Measurements," p. 36). Draw the graph.

Hourly Earnings in Cents	Frequency	Hourly Earnings in Cents	Frequency
23	3	27	22
24	7	28	7
25	20	29	1
26	28		

The median. — Another central tendency that should be better known and more widely used is the *median*. As its name suggests, it is in the exact middle of the distribution, the point above and below which lie an

What is the median?

equal number of cases. The median score is obtained by counting in from either end of the tabulated measures till the middle case is reached; the score which that middle case gets is the median score. The formula is $\frac{n+1}{2}$. Thus, if we have 17 children tested in anything, after having arranged the recorded abilities in serial order, we count in till the 9th child is reached; the rating given him is the median score for the group of 17. In exercise 1 above there are 25 cases Counting in till the 13th case is reached, we see his score is C; therefore the median score is C. If we have an even number of cases, we have, not a median score but a median point halfway between the scores of the two middle cases. Thus in exercise 15 below, with 56 cases, the median point is between the scores gained by the 28th and 29th individuals $\left(\frac{n+1}{2} = 28\frac{1}{2}\right)$. Counting in from either end, since both the 28th and 29th persons get a score of 5, the median is 5, without need of further refinement.

Exercises

Find the median in the two examples below.

6.

Grade	Freq.
F	1
D	0
D+	4
C	10
C+	13
B	9
B+	5
A	3

7. Taken from Goddard

Mental Age	Freq.
6	1
7	3
8	12
9	58
10	124
11	50
12	42
13	30
14	6

8. Find the median in example 5.

INTERPOLATED MEDIAN. — When we are dealing with scales in which the steps are big, such as in Illustration 1 where the step is five, or ex. 3 where the step is three, we should take into consideration just what the score means and interpolate accordingly. Thus 60 stands for a rough measure only, probably the lower limit of a range from 60 to 64.99, as noted before. We may suppose the abilities thus roughly measured really distributed evenly along the range, and in calculating a median, take this interpretation into account. Of the 33 cases in Illustration 1 the rating of the 17th person will be the median score. Counting in from the low end of the distribution we find he is the 8th person of the group of nine who are scored 70. Since 70 means from 70 to 74.9 and he is the highest but one in the group of nine, his score is obviously nearer 75 than 70. It will be 70 plus eight ninths of the step. Eight ninths of 5 added to 70 = 74.4, the median score. In example 3 above there are 65 cases. The median score will be that obtained by the 33d person. Counting in from the low-score end, the 23d case is the 2d in the group of sixteen who are scored 23, obviously near the lower limit of a step of three. Two sixteenths of the step must be added to 23 to give us the median; then, $23 + \frac{2}{16}$ of $3 = 23.37$, or more conveniently, 23.4. If the original measures have been only roughly scored, it is not wise to refine the median too far. In case the actual measures can be obtained it is advisable to get the real, rather than an interpolated, median. Thus, in ex. 2 above, if the children themselves were available, rather than calculating the median, (the 19th case) as the 14th out of the fifteen aged 9 and calling it $9 + \frac{14}{15}$ of 12 months, we should range those fifteen children in order of age and ask the oldest but one exactly how old he was, to a week, which would give us the median age for the group.

Exercises

Find the median in the following tables:

9.

Weight in lbs.	Freq.
80 to 89	1
90 to 99	6
100 to 109	11
110 to 119	16
120 to 129	4
120 to 139	1

10.

Score	No. of Children
−10	3
− 5	5
0	8
5	10
10	33
15	36
20	29
25	16
30	11
35	4
40	3

11. In example 7 interpolate the median, using 52 weeks as the range scored as a year.

The average. — The central tendency most commonly spoken of is the *average*. Unfortunately it is frequently misinterpreted, as in supposing that the "average performance" is what the majority do, or is a typical performance, or the one most frequently observed, or in itself a high standard. It is not any of these things, but is simply the arithmetic mean of all the cases observed, and is obtained by adding all the scores recorded and dividing by the number of cases. Thus in Illustration 1, we multiply

What is the average?

50 by 1
55 by 1
60 by 2
65 by 5

and so on — add the products and divide by n which is 33. The average score is 71.8. Verify this.

Exercises

12. Find the average age in example 2 above, considering 8 to mean from 8 to 9. Give the result to the nearest half year. If the score meant from $7\frac{1}{2}$ to $8\frac{1}{2}$, what difference would that make?

13. Find the average for example 3 above.

14. Is the average higher or lower than the mode, in each case?

15. Find the average of this table of scores, carrying to one decimal place only. Draw the graph.

Score		Frequency	
1	occurs	2	times
2	occurs	5	times
3	occurs	9	times
4	occurs	10	times
5	occurs	13	times
6	occurs	8	times
7	occurs	6	times
8	occurs	2	times
9	occurs	1	time

16. Find the mode and the average in example 7.

17. Which is found most quickly, mode, median, or average?

18. Which of the three involves most arithmetical work?

Comparison of three kinds of central tendency. — Comparing median, mode, and average, we see that the advantages of the average are its familiarity as a term and the degree of refinement to which it may be carried. Its disadvantages are: (1) that it sometimes expresses something that never exists as an actual measure, (2) that it is too readily influenced by extremes, and (3) that it takes rather long to calculate. Thus, (1) an average attendance of pupils for a week might work out at twenty-eight and three fifths, a somewhat startling suggestion, though of course the fraction is usually disregarded.

Again, (2) an average cash donation might be seven and a quarter cents; but if a plutocrat appears with a single contribution of five dollars the average will be very decidedly affected. The mode would never be expressed in an impossible score, and the median is not greatly disturbed by an exceptional extreme. The advantages of the mode are its information of what really is the usual score, and the great ease with which it can be found by a mere hasty inspection of table or graph. Its disadvantage is that it is rather a coarse measure and therefore awkward to handle in later calculations. In example 10 above, for instance, it might best be called the distance from 10 to 25 rather than 15. The advantages of the median, as already indicated, are that it is more rapidly found than the average, is a finer measure than the mode and as fine as the average, is a stable measure, a term easy to understand and less likely to be misinterpreted than the term average. A little practice in finding the median soon removes the disadvantage of less familiarity with its use.

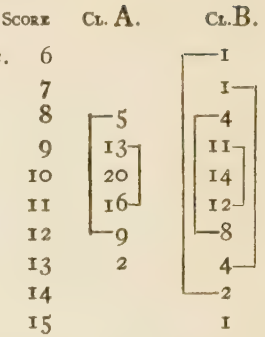
5. **Deviations from the central tendency.** — Fifth. Just as it is important to know the range of scores, so also it is important to have some measure of the deviations of the scores from any chosen expression of the central tendency. To know merely the mode gives us no idea of the variability of the scores, and, especially in comparing two groups, it is important to get an expression of the spread of the distribution curve beyond what the range tells us. If there is no fixed zero point but simply a grading in both directions from some unknown x taken as an arbitrary standard, this measure clearly tells us more than the range does. In comparing two groups with identical modes we have no way of telling how far the groups are similar unless we know something of the variations from the mode. Of the two tables of measures, one for class A, one for class B, though the mode is identical, the variability and the range are evidently quite different.

How are deviations easily measured?

Average deviation. — A measure of variability frequently used is the average deviation (A. D.) sometimes called the mean variation (M. V.). This is the average of the deviations of all the scores from the chosen central tendency. In the case of class A above, since 10 is the modal score, we note that there are 13 cases on one side of the mode and 16 on the other deviating from it by one step of the scale. There are 5 cases on the low side, and 9 on the high side deviating by two steps, and 2 cases deviating by three steps. Multiplying then, —

What is the A. D.?

Illustration 2.



Deviations of 0 step occur		10 times = 0
Deviations of 1 step occur	(13 + 16)	29 times = 29
Deviations of 2 step occur	(5 + 9)	14 times = 28
Deviations of 3 step occur		2 times = 6
		63

This divided by the *n*, which is 65, gives us .97 of a step as the average deviation in either direction. A. D. = ± .97. In the case of B the calculation is:

D of 0 step		14 times = 0
D of 1 step	(11 + 12)	23 times = 23
D of 2 step	(4 + 8)	12 times = 24
D of 3 step	(1 + 4)	5 times = 15
D of 4 step	(1 + 2)	3 times = 12
D of 5 step		1 time = 5

79, which divided by *n*, which is 58, gives 1.36 *of a step* in either direction.

A. D. = ± 1.36

since the step is 1. Where the step is larger than 1, as in Illustration 1, when we get A. D. as 1.33 of a step, — as it may be found to be, — we see that 1.33 of *the step* 5 gives us A. D. ± 6.65.

The A. D. can of course be found from the median or from the average just as well, though if we have a fine measure we shall be working with fractions of a step, since the deviations are not in integral multiples of a step. It will also be simpler not to work in both directions at once but to calculate the plus and minus deviations separately. Thus, in Illustration 1, since the average is 71.8, the 9 measures scored 70 deviate by − 1.8, the 7 measures scored 75 deviate by + 3.2. We state the facts conveniently thus:

On plus side,	On minus side
7 *d*'s of 3.2 = 22.4	9 *d*'s of 1.8 = 16.2
4 *d*'s of 8.2 = 32.8	5 *d*'s of 6.8 = 34.0, etc.,
etc.	etc.

Then add and divide by 33, the *n*, as before.

With a central tendency that does not fall near the mid-point of the range the A. D. must always be given for each direction separately. Thus we might have a + A. D. of 2.5 steps and a − A. D. of only .7 of a step if the mode came near the low end of a distribution.

Exercises

19. Find the A. D. from the mode in example 3 and example 6.
20. Find the A. D. from the average in example 2.
21. Find the A. D. from the median in example 5 and example 15.
22. Verify the A. D. from the mode in Illustration 1.
23. Draw a graph to illustrate the possibility stated in the paragraph just above.

Median deviation. — Another measurement of the deviations which is frequently given is known as the P. E. *What is the P. E.?* This is really the median deviation, *i.e.* the median of the deviations of all the measures from any given central

tendency, or, in other words, the limits above and below the central tendency which will include 50 per cent of the measures. (The letters P. E. stand for the name "probable error," confusing because it isn't an *error* at all, but the divergences or differences considered as probable, as an even chance, on a fifty-fifty basis.) Just as the median is more quickly found than the average, so the median deviation is more easily obtained than the average deviation. List the deviations, in units of a step if possible, in each direction from the chosen central tendency beginning with the smallest, till half of n have been listed. Thus, to help the eye, the deviations from the average in Illustration 1 might be arranged thus:

− 1.8	9 times
	7 times + 3.2
− 6.8	5 times
	4 times + 8.2
− 11.8	2 times
	3 times + 13.2

Thus we see that 16 measures are passed with the 9 minus and the 7 plus deviations. One more will be the median deviation, falling at 6.8, the next largest deviation. P. E. is therefore 6.8.

Exercises

24. Find the P. E. from the mode, the median, and the average in example 3.

25. Find the P. E. from the mode, the median, and the average in example 7.

26. Find the P. E. from the median in example 9 and example 10.

6. **Comparison of groups.** — Sixth. Having obtained a set of measures on one group of people we may very likely want to know how they compare with the same measures on another group. For instance, how do the ratings obtained in spelling in one school where a certain method is used compare with the ratings obtained in

How may groups be compared?

another school where a different method is used? The procedure is to tabulate the ratings for each, note the range, the median, and the A. D. of each group. Now supposing school A gets a median score of 70, and school B gets a median score of 78, and remembering that the median is the 50 percentile, we look to see what percentage of school A reach or exceed a score of 78, the median of school B. Obviously, only a small per cent will. Evidently also, in reversing the statements to show what percentage of school B reach or exceed the median of school A, a score of 70, it would be a large percentage. In reading statements such as " 20 per cent of group X reached the median of group Y," we interpret readily that Y's performance was higher, that the median for Y was higher, that the ranges overlap, with Y's higher.

Exercises

27. Compare example 6 with this table

D	1
D+	3
C	4
C+	9
B	12
B+	8
A	3

28. Compare example 9 with this table

lb.	
80	1
90	1
100	4
110	8
120	11
130	5
140	2

7. **Measurement of resemblance or correlation.** — Seventh. We need a convenient index of likeness.

Knowing something quantitatively about a given group of people, we may want to make a comparison with some other ability, trait, or performance in which they have been measured: (1) so as to discover any likeness or possibly unlikeness between the two things measured. (2) We might want some guarantee that the possession of one ability was related to the possession of another ability, so that a person ranking above the C. T. of his group in the one would rank above it also in the other. Or (3) we might wish to discover whether any cause operating to make one rank high in one thing tended to make one rank low in the other. Thus: (1) knowing ratings for spelling for a given school, how are they related to arithmetic ratings for the same children? (2) Is a person who is above the median for his group in quickness in memorizing above the median also for length of retention? (3) Does having more bad teeth than the average go with being less bright in school-standing than the average?

How may likeness be measured?

This correlation, known as *r*, is expressed by a measure varying from + 1.00 through zero to − 1.00. Perfect correlation, or + 1.00, would mean that the child getting the highest score in one got also the highest in the other — that the second best in one was second best in the other, and so on down to the worst in one being the worst in the other. Zero correlation would mean that there was no relationship whatever discoverable between the two sets of measures. Perfect inverse correlation of − 1.00 would mean that the highest in the first ability was the lowest in the other — that the second highest in the first was the second lowest in the other, and so on down to the poorest in the first being the best in the other. Any *r* on the plus side means a degree of resemblance; any *r* on the minus side means a degree of dissimilarity in relationship. The nearer any *r* is to zero the less relationship of any kind exists. Roughly, we expect correlation on the positive side between such measures as age and height of children; it will

not be so high an r as + 1.00 but it will be on the plus side certainly, since we add inches with years, so that the older members of a group are, on the whole, taller than the younger ones. Roughly we expect a zero correlation between height and shades of eye-color scaled on a tintometer, since we do not see what connection the two sets of facts might have. Roughly, we expect some negative correlation between age of graduation and a general index of class standing; for the older a child gets to be before leaving the eighth grade, presumably the less bright he is intellectually, and the lower class standing he has had.

A correlation coefficient of .95 means then a very close resemblance; of .50, that it is half as great as it might be. Given the divergence of any individual from the central tendency of his group and an r of, say .58, between the measurements of that ability and the measurements of another, then we may expect his divergence from the central tendency in the other ability to be 58 hundredths of the amount of his divergence in the first ability, and in the same direction, above or below the central tendency as the case may be. An r of 1.00 would tell us he diverged equally far in the same direction; − 1.00, equally far in the opposite direction from the central tendency.

The method of obtaining the r will not be shown here. Students wishing further information concerning it or other measures are referred to the books suggested below.

Exercises

29. What sort of r would you expect between height and weight? Between accuracy of aim and speed, when first learning to hit a mark? Between memory for digits and discrimination of pitch of sounds? Between speed of reading and intellectual superiority? Between size of vocabulary and age?

30. Criticize these remarks: (1) "They do poor work in that class; only half the pupils came up to the average." (2) "They're just as good on the average so they must be alike." (3) "X gained

only 10 points since the last test, Y gained 20, so Y has done twice as well as X."

31. Draw a graph to show normal distribution, mode and median coinciding.

32. Draw a graph to show a skewed curve, the mode near the low end of the range.

33. Draw two graphs superposed on the same range, the mode of one coinciding with its median, the mode of the other near the high end of the range.

34. Draw two superposed graphs, their medians coinciding, the range of one wide, the range of the other narrow.

35. Draw two superposed graphs, normal distribution, so that the median of one falls approximately at the — P. E. of the other.

Formulæ for Reference

$$\text{Average} = \frac{\Sigma m}{n} \qquad \text{A. D.} = \frac{\Sigma d}{n}$$

$$\text{Median} = \frac{n+1}{2} \qquad \text{P. E.} = 0.8453 \text{ A. D.}$$

Σ = sum of
m = measures
n = number
d = deviations

References

Thorndike, *Mental and Social Measurements.*
Rugg, *Statistical Methods Applied to Education.*

GLOSSARY

A. J. P. American Journal of Psychology.

A. P. L'Année Psychologique.

Adenoids. Enlargement or disease of the third tonsil.

Adumbrated. Foreshadowed.

Æsthetic emotions. Emotions that have to do with æsthetic judgments, feelings of beautiful, humorous, etc.

Affective states. Feelings of pleasantness or unpleasantness accompanying sensations and other mental states.

Alternate inheritance. Resemblance to one parent exclusively in some trait.

Amentia. Mental deficiency.

Anæmia. Deficiency of blood.

Animism. Belief that inanimate objects have a soul.

Anthropomorphic. Attributing human form and characteristics to Deity.

Apperception. Taking in and interpreting new material on the basis of the old.

Asexualization. Rendering neuter, sterile.

Astigmatism. A vision defect due to uneven curvature of the cornea or lens, causing uneven focus of light rays and varied brightness of objects.

Asymmetry. Lack of symmetry.

Atavistic. Reverting to remote ancestral traits.

Atypical. Irregular, divergent from type.

Automatization. Making habitual, mechanical.

Average. The mean; the sum of a series of measures divided by their number.

Average deviation. The average of the divergences of all the measures from some central tendency.

Blended inheritance. Resemblance to a mixture of the parents' traits.

Calories. A unit of food value. (The heat required to raise 1 gram of water 1 degree centigrade.)

Carbohydrates. Foods containing 6 atoms of carbon, or a multiple of 6, hydrogen and oxygen in the proportion to form water. Usually in the form of starches or sugars.

Cephalic index. Ration of width to length of head.

Chorea. "St. Vitus' dance"; muscle twitchings and jerks.

Chronological age. The time elapsed since birth.

Coefficient of correlation. An index of resemblance.

Coefficient of intellectual ability. Ratio of obtained score in a mental test to the norm for the age.

Congenital. Existent from birth.

Consanguinity. A close degree of blood relationship.

Constructive imagination. Productive imagination which constructs according to directions objects the accuracy of which can be checked up.

Cornea. The front part of the outer coat of the eyeball.

Cortex. The gray matter of the brain on the outsides of the convolutions.

Creative imagination. Productive imagination which is unhampered, unrestricted, "fancy-free."

Cretinism. A clinical type of idiocy or imbecility due to lack of thyroid gland secretion.

Dementia præcox. An adolescent form of insanity.

Desultory memory. Memory for unrelated, heterogeneous material.

Distribution curve. A graphic representation of the grouping of a series of measures.

Distribution table. The statistical form of presenting the grouping of a series of measures.

Disuse. A method of modifying instincts and habits by withholding any stimulus which might bring about a response.

Duration of attention. The length of time the attention is centered on a single stimulus.

Empirically. By first hand, direct experience; by experiment.

Eugenics. The science of improving offspring, of insuring good birth.

Explicit judgment. An interpretation of experience in which the grounds for the inference are clearly expressed.

Forced attention. Attention involving effort.

Free attention. Attention given with no feeling of effort.

Generic images. Imagery not of specific things but with only the generalized features of a class of things.

Graph. A pictured or diagrammatic way of representing statistical facts.

Hydrocephaly. A clinical type of physical and mental defect, characterized by too much fluid either between the membranes lining the skull or in the cavities of the brain itself.

Hyperopia. A vision defect due to too short an eyeball to permit the light rays coming to focus on the retina. Long-sightedness.

Hysteria. A nervous disease of adolescence.

Idiot. The lowest range of aments, those needing complete physical care. See page 320.

Illusion. A misinterpretation of sense experience, a false perception.

Imbecile. The middle range of aments, those able to avoid physical danger, but unable to care for themselves economically, socially. See page 320.

Implicit judgment. An interpretation of experience in which the grounds for the inference are used unreflectively, are presupposed.

Inhibition. Interference with a nervous discharge by an opposing force.

Intelligence Quotient. "I. Q." The ratio of mental age, as determined by tests, to chronological age.

J. Ed. P. Journal of Educational Psychology.

Lalling. Mispronunciation of consonants.

Larceny. Theft.

Law of effect. If a response to a situation results in satisfaction, the tendency to respond similarly in future is strengthened. Conversely, if a response results in discomfort, the tendency to respond similarly is thereby weakened.

Law of exercise. The likelihood that a given response will be made to a given situation is in proportion to the frequency of its connection with the situation.

Law of regression. The characteristics of offspring vary, not about the parental deviation, but about a point between that deviation and the mode for the whole population.

Masochistic. Sexually excitable by experiencing pain or ill-treatment.

Median. The point above and below which lie an equal number of measures.

Median deviation. The median of the deviations of all the measures from the central tendency; the limits above and below the central tendency which will include half the measures.

Mendelian. According to Mendel's theory or law. See page 3.

Microcephaly. A rare clinical type of ament characterized by a very small, peaked head.

Mode. The most frequent measure.

Molars. Double, grinding teeth.

Mongolian. A clinical type of ament characterized by a facial resemblance to the Mongolian race.

Moron. The highest range of aments, handicapped mentally, socially, and economically, but capable of working under supervision.

Motor centers. Areas in the brain from which nerve impulses are sent out to the muscles.

Motor images. Mental representations of being in motion passively, or of moving parts of the body.

Myopia. A vision defect due to too long an eyeball to permit the light rays coming to focus on the retina. Shortsightedness.

Negative correlation. Index of resemblance varying from 0 to −100, indicating inverse relationship.

Neurasthenia. Nervous debility.

Neurones. Nerves, consisting of fibrils called dendrites, a cell body, a fiber called the axone ending in fibrils called the end-brush.

Neurone circuit. A chain of three types of neurones, those that receive impressions, the sensory; those that connect with various parts of the brain, the associative; and those that move the muscles, the motor.

Obliviscence. Forgetting.

Ontogeny. The history of the development of an individual.

Organism. A structure acting by means of organs; roughly, any living plant or animal.

Orgasm. Excitement and swelling.

Ped. Sem. Pedagogical Seminary.

Percept. Interpreted sense experience; consciousness of things present to the senses.

Phobia. Excessive fear of anything.

Phylogenetic. Pertaining to the history of the development of the species.

Phylum. The big branches of the animal or vegetable kingdoms.

Plasticity. The condition of capability of change, neither too sudden nor too temporary.

Plateau. A place in the practice curve more or less on the dead level, representing lack of measurable progress.

Positive correlation. Index of resemblance varying from 0 to 100.
Practice curve. The graphic representation of progress in learning. It shows a sharp slant at the beginning, one or several pleateaus, gradual flattening out to a level of efficiency.
Predatory. Plundering, pillaging.
Productive imagery. Images combined in new ways.
Protozoa. One-celled animal organisms.
Puberty. The age of sexual maturity.
Pubescent. Relating to the beginning of puberty.

Range of attention. The number of things that may be attended to, grasped, simultaneously.
Recall. Reviving past experiences.
Remote sensations. Those felt in the part of the body not directly moving; *e.g.* in the eyes when walking.
Resident sensations. Those felt in the part of the body that is acting; *e.g.* in the hand when writing.
Retention. Holding impressions so that they may be recalled.
Retroactive inhibition. The influence of recent experiences on earlier ones making them less clear in memory.
Rickets. A young children's disease involving crookedness of the long bones and swelling of their extremities.

Sadistic. Sexually excitable by inflicting pain on others or watching it inflicted.
Senescence. Growing old.
Siblings. Offspring of the same parents, *i.e.* brother-brother relationship, or brother-sister, or sister-sister.
Skatophilia. Undue interest in excretory processes, excitement therefrom.
Span of attention. See range.
Stimulation. A method of developing instincts and habits by providing extra situations to arouse the responses.
Strabismus. Lack of balance in the muscles moving the eyes, causing squint, cross-eyes, etc.
Sublimation. Changing the emotion connected originally with an instinctive response so that it is felt in other situations.
Substitution. Changing the instinctive reaction to a situation.

Tertiary. Third.
Threshold. The point at which the intensity of a stimulus is sufficient to produce a sensation.

Tics. Nervous twitching habits.

Toxic. Poisonous.

Trial and error. A method of learning in which successive attempts are made with no clear idea of their value or probable result.

Voluntary attention. Attention given with a feeling of effort.

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